GRUMMAN plane news

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Tomcat team earns 'Well Done' for F-14 trials at Point Mugu

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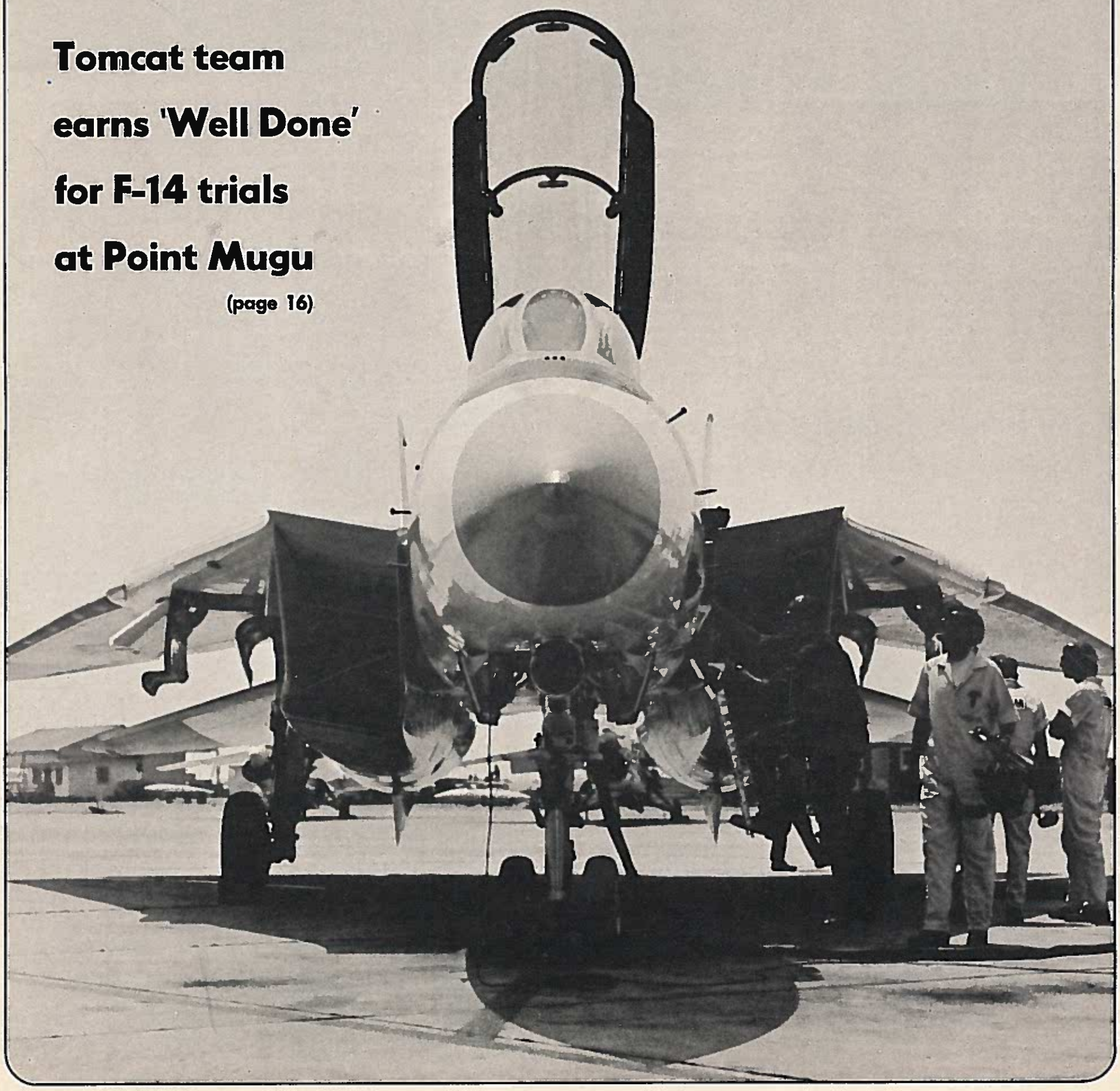

Gavin says Company task force pursuing Space Shuttle work

"We're looking ahead, not to the past," says Vice President Tom Kelly. "We believe we've got the best team in the business, and we intend to be part of national space programs."

As Joe Gavin, President of Grumman Aerospace, put it, "We have many strengths to contribute to the Space Shuttle Program, and we believe that both NASA (National Aeronautics and Space Administration) and North American Rockwell are aware of our fine capabilities. So we're pressing for a role in Shuttle business and I'm fairly confident that we will play a sizable role."

A preliminary but well-defined "shopping list" has been delivered to NASA and North American already, Kelly indicated. "We've prepared a package of subcontract proposals," he says, "and our meetings with North American have been cordial and constructive. Frankly, I think we're in good position because of our demonstrated record and of working closely, side by side, during the Apollo Program."

Shuttle task force

The jobs now are to get things moving as rapidly as possible and to discuss areas in which NASA reported we were strong, such as avionics integration, structures, propulsion, and systems integration. In pursuit of those goals, a task force has been set up under the direction of Fred Raymes, who headed the proposal effort. The task force is to examine the full spectrum of work that Grumman could perform in space, to assess where we stand, and to study still better ways of exploring space and transforming space work into concrete benefits for "earthlings."

The brunt of the leadership role will be borne, of course, by Vice Presidents Kelly and Larry Mead, who'll be striving to meet the $1 billion goal (or more) of work set down by Gavin.

That there are problems ahead was stated candidly by Kelly. He cited a couple: President Nixon's Executive Directive to reduce the budget, "which will have impact on NASA's funding," and a proposed 20-percent hike in Social Security. These factors could make for a considerably slower start in the Space Shuttle. In other words, subcontract work would build up slowly. So, as in an old saying, there is a tough row to hoe.

"It won't be easy," says Kelly, "and it's natural that we've suffered an emotional let-down. But we know from the debriefings that we had a first-class proposal—one of the finest proposals we've ever turned out. And everybody in the Company got behind it. It showed. NASA saw that and said it was a superior effort. Everybody who worked on the proposal should be proud . . . very proud.

"Now we have to do everything within our power to keep our capability."

Kiesling's a believer now . . .

It's a short story but one with very human overtones: Ernie Kiesling did wear his safety glasses one Saturday morning when he was drilling titanium. "No, I didn't always wear them. But I do now."

He was using a drill that "had been working fine" on titanium, he said, but titanium is tricky, and this drill broke while Kiesling was using it. A piece hit him in the lens of his safety glasses, shattering it but not injuring the eye. This all happened in June, and the other day Grumman's 51st Wise Owl (that's Ernie) received his Wise Owl Club insignia and a plaque. His wife and two children appreciated these, but more so do they thank Kiesling's lucky planets that he had thought to wear his safety glasses.

Spectacles are 'mod.' Ernie Kiesling (2nd L), mechanic in F-14 Forward Module, Plant 1, got a new pair after the drill he was using broke and shattered his safety glasses. Here he accepts a Wise Owl insignia from Bill McLean (2nd R), Plant 1 manager, and a plaque from Tom Merritt, F-14 Manufacturing director. Others are Vin Iannacone (L), foreman, and Jack Jackovich, Safety. (Photo by Jim Wagner)

'Configuration' his field. Two days spent last month with Capt. D. P. Crosby (2nd L) generated better understanding of Navy-Grumman aircraft modifications. Participants in talks were Paul Colon (L) and Ed Hantz (R), Grumman Configuration/Data Management, Capt. Bob Belter (C), NAVPLANT rep, and Senior Vice President Corky Meyer. (Photo by Fred Annette)

Navy, Grumman officials huddle on aircraft configuration control

Keeping Navy aircraft up to date and efficiently serviced world wide takes a lot of planning on the part of the Navy and of its contractors. Last month Grumman held a mutually rewarding two-day conference with Capt. D. P. (Bing) Crosby, director of NAVAIR's Configuration Management, at Bethpage, Syosset, and Calverton plants to brief each other on NAVAIR's Configuration/Modification Management Program. Grumman brought Captain Crosby up to date on Grumman Configuration Management procedures being used on the Versatile Avionic Shop Test (VAST) stations at Calverton. A significant part of the two-way conference had to do with the Navy's problems and the solutions it proposes in Kit/Modification/Management. Emphasis was on technical directives and acquisition of integrated logistic support for aeronautical weapon system changes.

Keeping up-to-date

The great importance of Navy-Grumman cooperation on Configuration/Data Management was brought out by Ed Hantz, Grumman director of Configuration/Data Management, when he pointed out that "Grumman's change business with NAVAIR is a substantial portion of our annual sales. "These changes, he said, "keep our aircraft and systems up to date, and they extend the aircraft capabilities and delay aircraft obsolescence. Through the medium of the Engineering Change Proposal, for example," he pointed out, "we have extended the life cycle of the A-6 family of aircraft into the 1980s. The A-6B, A-6C, KA-6D, and EA-6A were all initiated in this way."

"NAVAIR's progress in prompt funding and authorizing the support elements of Engineering Change Proposals has improved considerably during the last few years," added Paul Colon, deputy director of Configuration/Data Management for Support. "This improvement has contributed considerably to the successful support of Grumman aircraft in the Fleet."

Captain Crosby, who is chairman of all NAVAIR's Change Control Boards, spent July 17 and 18 with Capt. Bob Belter, Naval Plant representative at Grumman, and with Grumman management groups. His report on NAVAIR progress and the problems NAVAIR encounters in requesting, approving, funding, implementing, and changing status of aircraft and of support equipment and trainers, publications and spares, was delivered to program directors, department heads, Product Support managers, Product Manufacturing and plant managers, VAST management at Calverton, and Configuration/Data managers. They, in turn, had a chance to confer with him on their own procedures and problems. Captain Crosby's summation of the meetings was that it was the hope of the Navy to improve the understanding of all the Navy commands and Navy contractors, and foster "more efficient change management from idea inception to operational employment."

Surplus sale

Sales of surplus office furniture have been announced by Grumman's Property Management Department: one in Bethpage on Saturday, Sept. 30, and another at Calverton in late October. Further details will be published in the September 11 Plane News.

On the move . . .

The Nassau County Veterans Service Agency is in a new home now. The new location: Room 505, One Old Country Rd., Carle Place, N. Y. 11514.

Three decks of parking space are available at the new location with special areas designated for the handicapped.

Four elected to new posts in Grumman Corporation

Grumman Corporation Board of Directors on August 17 announced the election of two new Directors, a Vice President-Controller, and a new Treasurer. Clint Towl, President and Board Chairman of Grumman Corporation, made the announcement following a meeting of the Board of Directors at Bethpage.

New Directors of Grumman Corporation are Joe Gavin, President and a Director of Grumman Aerospace Corporation, and Harry Howard Jr., Executive Vice President-Operations of American Can Company. They succeed Roy Grumman, a founder of Grumman Aircraft Engineering Corporation, who retired as an active member of the Board but remains its Honorary Chairman, and Lew Evans, former Corporation President, who died July 9.

Clint Towl also announced the appointment of Pat Cherry, former Treasurer of the Corporation, to the newly created post of Vice President-Controller. Bob Freese, Assistant to the Treasurer, becomes Treasurer.

Joe Gavin has been President of Grumman Aerospace since July 21, 1972, when he succeeded Bill Zarkowsky to that post. He has been with Grumman since 1946, first as a design engineer on the XF9F-2 (Grumman's first jet fighter). He then moved to Preliminary Design and in 1950 was appointed project engineer on the F9F-6. In 1956 he became chief experimental project engineer, and the following year, chief missile and space engineer.

Gavin was elected Vice President in 1962 when he was made director of the Lunar Excursion Module Program. He became director of Space Programs in October of '68, and with the incorporation of Grumman Aerospace, a Director of that subsidiary in May of 1969. In February of 1970 he was elected Senior Vice President.

Gavin is a graduate of M.I.T. with a Bachelor's and a Master's in aeronautical engineering. He served in the Navy from 1942 to 1946. He and his wife have two sons and a daughter and are residents of Huntington.

Pat Cherry

Bob Freese

Joe Gavin

Harry Howard Jr.

Operations chief

Howard, a graduate of Dartmouth College in 1940 with a Bachelor's degree in sociology, is Vice President-Operations and a Director of American Can Company. He is also a member of the Board of Hayden Publishing Company and Carefree Development Corporation of Carefree, Ariz. He joined Butterick Company in 1945 and was its President when it was acquired by American Can in 1962. He attended Harvard Business School in 1941 and served in the Navy in World War II, attaining the rank of lieutenant commander. He is a native of Los Angeles and a resident of Woodcliff Lake, N. J. He has five children.

Extensive experience

Cherry, now Vice President-Controller, is also Treasurer and Director of Grumman International Inc. and Treasurer of Montauk Aero Corporation, both Grumman subsidiaries.

From 1940 to 1956, Cherry was in supervisory positions in Accounting. In 1956 he became Treasurer of Aerobilt Bodies and Chief Accountant at Grumman, then, in 1963, Controller. Three years later he was named Treasurer-Controller of Grumman Aircraft, and in 1969, of Grumman Corporation.

He and his wife live in Merrick and have a daughter and two sons. Cherry attended Pace Institute, Cornell School of Industrial Management, and M.I.T. School of Industrial Management Senior Executive Course. He belongs to the Institute of Internal Auditors and L.I. Chapter of the Air Force Association.

Manhattan graduate

Bob Freese joined the Grumman Accounting Department in late 1956, becoming manager of Billings and Revenue and then financial manager of Grumman Aircraft. When Grumman Aerospace was formed in 1969 he became director of Finance and Financial Relations. In August of 1971 he transferred to Grumman Corporation as assistant to the Treasurer of Grumman Corporation. His new office is in Plant 5, adjoining Pat Cherry's.

Freese took his undergraduate work at Manhattan College and got his Master's in Business Administration at New York University. He worked in Internal Audit for Texaco, 1951-56, with two years out for Army service, in the Adjutant General Corps. He is an active member of St. Ignatius Loyola Parish School Board in Hicksville. He plays golf, and likes bowling, fishing, and reading. He and his wife have two daughters, 12 and 9, and a son, 6.

Grumman, West German firm to work on future VTOL design

Grumman Aerospace has signed a working agreement with the West German aerospace firm VFW-Fokker (GMBH) that provides for cooperative effort in the development of a supersonic VTOL (Vertical Take-Off and Landing) tactical aircraft for the U. S. Navy.

Grumman is currently competing for a Navy contract award to build a prototype VTOL strike fighter aircraft that can be used aboard so-called sea-control ships—that is, small, inexpensive ships that supplement existing aircraft carrier forces.

VFW-Fokker, recognized as a leader in high-performance multi-engine VTOL aircraft, has built such a plane and is flight-testing it in Germany.

Grumman is also working with the British Aircraft Corporation under a prior agreement through which both are cooperating in the development of tactical VTOLs to meet U. S. and United Kingdom needs.

These agreements support the Department of Defense's objectives to build a greater degree of cooperation among nations of the free world in research and development, thereby avoiding duplication of effort and unnecessary costs.

About the cover . . .

This nose-on view of one of the two Tomcats that flew in the Navy Preliminary Evaluation IIB at Point Mugu, Calif., was snapped by Warren Rohde of Presentations. Early word was that the NPE was a good one.

High flyer. An idea of a new type of aircraft with Vertical Take-Off and Landing (VTOL) capability is depicted here by Bud Parke, with 'sea control' vessel on the water.

First in the family. Grumman FF-1, the last of its kind according to Museum officials, is displayed at Pensacola. The FF-1 was the first Navy carrier-based fighter with retractable landing gear.

Offering 'level-income' option for those going to retire early

Grumman Corporation will offer a "level-income' or Social Security adjustment option for employees who want to retire before the age of 62. The option plan will be available beginning September 1, 1972.

Basically, the option provides an employee with the opportunity of receiving a larger Company pension during the period prior to the receipt of Social Security benefits. But at age 62, the pension would be reduced by the amount of the individual's projected Social Security benefits. The result would be a level-income retirement payment.

Dan Knowles, director of Personnel, gives a hypothetical example: "Say an employee retires at age 58 at a pension of $220 a month. At age 62 he expects to receive Social Security benefits of $204 a month, which would boost his income to $424 a month.

"However, if he chooses the new pension option, he'll receive $381 per month from age 58 and that will be constant throughout his retirement years."

In other words, a level-income pension increases Grumman benefits before age 62 and decreases Grumman benefits after age 62, and the variance, or reduction, in the pension benefits after 62 is equal to the amount of the projected Social Security benefit. The total pension income, however, remains constant throughout the retirement period. Before the option is incorporated in the Grumman Pension Plan it must receive the necessary Federal approval.

A full explanation of the "level-income" option will appear in the September 11 issue of Plane News. In the meantime, any questions regarding the new plan should be directed to the Pension office, Plant 28, Ext. 9179.

Pensacola holds rich store of Naval air history

Pensacola, where most Naval and Marine Corps aviators begin their quests for the coveted "Wings of Gold," is the home of the Naval Aviation Museum, a memorial to the men who challenged a once new dimension of powered flight.

The restless ghosts of Towers, Chevalier, Ellyson, Mustin, Saufley, Corry, and Whiting hover protectively over the priceless collection of aircraft bearing exotic names familiar to every schoolboy who has ever labored over his history lessons. Here are the Hellcat, Bearcat, Triad, Skystreak, Corsair, and Crusader; immortal names indelibly engraved in the Navy's aviation honor roll of history.

The names of their builders—Grumman, Douglas, Curtiss, Boeing, and Chance-Vought — roll from the tongue as easily as the mind's eye recalls their aerial adventures.

Hellcat on display

Tugging restlessly against their tiedowns and eager for display are World War II fighters which made legends of their pilots: the Grumman "Hellcat," the Chance-Vought "Corsair," and the Vought "Kingfisher" observation plane which, with other scouting planes, earned the nickname "eyes of the fleet."

Sleek and silent, their jet engines stilled forever, stand the Douglas "Skystreak" which set world speed records in 1947, and the Grumman "Panther" of Korean War renown. Here, too, is the loveable, lumbering workhorse of the Vietnam and Korean Wars, the Douglas "Skyraider," the last Navy A-1 to make a combat strike over Vietnam. The date was Feb. 20, 1968.

Each year, approximately 75,000 visitors to Pensacola make the short drive from downtown to the Naval Air Station to view and admire these priceless exhibits.

The Naval Aviation Museum is open to the public without charge. Tuesday through Saturday the hours are from 8:30 to 4:30; Sundays from 12:30 to 4:30. It is closed on Thanksgiving, Christmas and New Year's Day.

'Copernicus' joins OAO-2 in 'star gazing'

Copernicus is in orbit. At 6:28 last Monday morning the NASA/Grumman Orbiting Astronomical Observatory rose from its launch pad at Cape Kennedy and with "everything nominal," settled into a circular orbit 460 miles in space. Carrying a 32-inch reflecting telescope, it will send back continual data on interstellar space in ultraviolet light for Princeton University. For the University College of London it will be investigating X-ray emissions from stars. At 2½ tons, this is the heaviest unmanned scientific payload ever launched by the United States.

One of Copernicus' first programmed tasks after getting rid of its shroud was to shed the dust covers that protected its sun baffles during launch, and then to release the springs that held the Princeton experiment mirrors. It will take a week to insure that all systems and experiments are in order.

Copernicus is the first U.S. unmanned satellite to have a name, and the launch of this fourth OAO inaugurates the United States' contribution to the Copernican celebration for astronomers throughout the world. Nicolaus Copernicus, the Polish astronomer, revolutionized astronomy 500 years ago when he recognized that the sun and not the earth was the center of the then-known universe.

Stellar discovery

OAO-2, launched on December 7, 1968, continues sending back important scientific data. One of its discoveries has been a vast hydrogen cloud a million miles in diameter around the Tago-Sato-Kosaka comet. If everything continues to go well, Mission Control at Goddard Space Flight Center will now be giving instructions to two satellites as they follow each other around the earth in dependable orbit.

"This is a terribly exciting adventure in astronomy," said Dr. Lyman Spitzer Jr. of Princeton University this week. "We will be able to study the stars and stellar clouds in a way that until now has been impossible."

Reshape Tech Ops administration

Last spring Jake Bussolini was named director of Administrative Operations for Technical Operations, reporting to Senior Vice President Grant Hedrick. One of Bussolini's tasks was to set up a single organization to handle procedures, finance, budgets & resources, wages & salaries, secretarial services, and all administrative functions for Technical Operations. There was a need to standardize operating practices and controls.

Bussolini has now announced the management and supervisory appointments for his organization. Heading the list is Bill Kelley, who will be manager of Personnel Operations. Hank Belay is manager of Resource & Operations Control, and Al Wallace is manager of Administrative Support.

Section heads are Bruce Hausser, Operations & Controls; Steve Juengst, Administration; Edith Thumer, Secretarial Services; and Bill Rooney, Resource Control.

"We are making plans to relocate all Administrative Operations management and supervision into the Plant 35 technical center," Bussolini said last week. "Until that move is completed, however," he added, "we will continue to work toward consolidation of operational functions from our existing facilities in Plants 5, 34F, and 35."

Apollo 17 set for trip to pad

LM-12, the last of the Lunar Modules, has put on its wraps, its exterior hidden from view until shortly before it nears its destination, the moon's surface. The liftoff is scheduled for December 6.

The LM went into the lower SLA (Spacecraft Lunar Module Adapter) on the 16th. On the 17th, the Command Service Module was covered by the upper SLA, and the cocoon was complete.

Jerry Goldmacher, spacecraft director for LM-12, as he had been for LMs 10 and 11, said that "All altitude chamber runs, which simulate as closely as possible what the crew and spacecraft 'see' in the actual space environment, were completed last month. The LRV (Lunar Roving Vehicle) was installed early this month and, after that, C2F2 (Crew Compartment Fit and Functional) was done. That was on the 11th. Four days later, landing gear functional tests were run successfully."

The LM and CSM were to have been moved to the VAB (Vertical Assembly Building) August 23, a day before Plane News went to press.

This coming Monday, the 28th of August, the entire Apollo vehicle is to be moved to the launch pad.

Honestly!

Grumman Guard John Redmond was making his "three to eleven" loop the other night when Jim Baker of Facilities Maintenance gave him a wallet he'd found in Plant 35. He'd counted the contents and had found identification.

Sherri MacAaron, secretary for F-14 Loads & Dynamics, found a note on her desk the next morning from Baker. "You can stop worrying," it said.

So Guard Redmond's supervisor, Capt. Bernie Hill, felt good about the whole thing, and Baker's foreman felt good, too. Sherri wrote an AVO to him with a copy to Baker expressing her appreciation for the return of the wallet and its contents.

"It is another prime example of the proven honesty of our Maintenance employees," said Captain Hill.

Mohawk record. John Neher, a civilian flight instructor at the U.S. Army flight school at Camp Rucker, Ala., set a formidable record recently when he topped the 5,000-hour mark in the OV-1 Mohawk. In a ceremony attended by Bob Benito (L) and John Kendrick (R), Vice President Ross Mickey presents Neher with a plaque honoring the achievement.

Payment earned. Erwin Giesemann (2nd L) and Irv Wiggins (2nd R) turned in outstanding jobs in reducing E-2C procurement costs. It earned for them recognition by Al Schuckle, director of Inventory Management, and Gerry Rabkin, manager of Inventory Control, and also $25 U.S. Savings Bonds for the effort.

You've heard of 'the biggest ever,' well . . .

"The smallest Grumman picnic ever" —that's the way it was billed in New Mexico, just outside Alamogordo.

It may have been the mini-picnic, but zeal was not lacking. Some 30 Grummanites and their families, and Ed Salik of Hazeltine, were in an amphitheater formed by sand dunes at the White Sands National Monument, and did they live it up!

The wives prepared a smorgasbord, and there were such foods as chicken, ham, meatloaf, salads, beans, pepperoni, steaks, and the inevitable hot dogs. There was a tug-o'-war and something called dune-sliding, plus motorcycle rides for the kids provided by Linc Pearsall of Plant 14.

Not only that, a Park Ranger gave a talk on the origin of White Sands, there was a film on the formation of the Great Lakes, and (probably the most beautiful of all) a long, long look at the clear, star-packed sky.

Base manager Ralph Laho did the honors, while Wendy Brown, Roy Latham, and the families of Gene Burke, Mike Moore, Mike Neglia, Bert Wengler, and Pete Woltmann enjoyed the time of their lives.

Still feeding 'em

Transferring jet fuel in the air by using "Boomer" KA-6D tankers saves time "on station" and improves security for the carrier. The tankers, according to Lt. A. A. Anderson, Public Affairs officer for the "Boomers", have played a "vital role in air operations aboard the USS Constellation." Fighter combat air patrols guarding the task force depend highly on the tankers, and much of the success of the Boomers' tanking mission, says Lt. Anderson, is due to these older, refitted "A's," which can transfer 12,000 pounds of fuel on a "full cycle" and 20,000 pounds on a "yoyo" cycle.

See-through plastic provides engineers with 'inside' view

In a relatively small area set between the Tomcat fatigue test article and the two structural prototypes on the floor of Plant 5, two men, Frank Horsch and Bob Schwarz, are busily engaged in what may be new to many Grummanites — photo-elastic analysis, also called photo-elasticity.

Schwarz says the brunt of the effort is the use of experimental optical techniques for determining stress distributions and stress magnitudes; and it's done by using transparent plastic models of real aircraft parts and sections. Its fruitfulness has been demonstrated in F-14 model tests of several critical areas of the wing center section—an analysis begun in the early design stages. "It's a particularly useful method in the preliminary stages of design," says Schwarz, "because it allows you to verify designs and make improvements in them. It also saves a lot of time and money because you can 'see' what'll happen to a part before a structural commitment is made."

If it sounds a bit mysterious, akin to the world of magic and illusionism, dispel the idea. It's strictly scientific, and it works. If you can't solve a problem of stress by use of an analytical model, says Schwarz, "photo-elasticity will in all probability give you the answers you need."

Stress freezing

Put in its simplest terms, two-dimensional (on one plane) and three-dimensional scale models made from clear plastic are "loaded." Three-dimensional models go through stress-freezing by being brought to elevated temperatures so a model is deformed proportionately to the applied stress (load) and then brought back to room temperature. That "freezes" the deformation. Since the stress load ratio in the model will be equal to the stress load ratio in the actual structure, it's possible to see exactly what would happen to an actual piece of, say, titanium put under the same stress. What is seen — depending upon the shape of the item under analysis — is a series of stress lines, stress waves, or, in some instances, an absence of lines, indicating the absence of stress.

"One of the advantages of the optical-stress analysis with three-dimensional models," says Horsch, "is the ability to 'work on the inside,' that is, to slice a section of the interior—something you can't do with structure—and examine it for answers to questions of stress distributions and magnitudes.

"Another big advantage is full-surface stress distributions: you can see where all the stresses are, and their magnitudes. That shows us the whole picture, and that means we can re-work a piece in advance, before it's metal."

Other methods, too

Although 90 percent or more of the activity Horsch and Schwarz handle relates to photo-elasticity, three other techniques are being developed aggressively: holography, fringe multiplication, and interferometry. Holography is an optical sensing technique to measure surface deflections within wave lengths of light, "deflections so small," says Schwarz, "that you can't see them. The importance to us is that you may detect a weakness in structure, a point at which a structure might fail. Having a key to that in advance is a big help."

Fringe multiplication is a bit more esoteric. The idea is to position mirrors at different angles; what's seen is a row of progressively dimmer spots because light reflects back and forth through the plastic. As Schwarz puts it, "It makes the plastic 'think' it's thicker than it is."

And then there's a two-dimensional interferometer that produces a stress sum. That is, when combined with a two-dimensional photo-elastic model, it does for an entire field analysis what strain gauges do for particular points.

"A lot of this gets very technical," Horsch says, "and is virtually impossible to express in layman's terms. It all boils down, I guess, to getting very accurate analyses of what can happen with specific shapes under specific loads—and getting that information fast so that expensive structure doesn't have to be re-worked, or even cast aside."

New task for Mohawk

Here's a different job for the OV-1B Mohawk. NASA's Lewis Research Center in Cleveland, Ohio, is getting a "Project SEAMORE" OV-1B (SLAR) to use for analyzing ice coverage distribution in the Great Lakes region. Ice navigation information will be used to assist extension of the shipping season as part of an overall program in which many Federal agencies are engaged. NASA is a technical adviser.

New tuition rule for GDS studies

About a year ago the Grumman Data Systems Institute at 17 W. John St. in Hicksville became accredited by the New York Institute of Technology. Now Data Systems Institute students working toward a bachelor's degree in day or evening classes are eligible for college credit and tuition reimbursement if they qualify scholastically and continue with their education in an approved college.

The Grumman Data Systems Institute offers 360 hours of study and teaches all computer programming languages, including FORTRAN, COBOL, Assembler (a machine-oriented language) and Job Control Language. Eighteen college credits can be earned, according to Stan Schrager, director of GDS Institute. The cost is $1,495. Grumman employees and their families are eligible for a discount of 10%.

"We also teach keypunch and in this we have a new class starting every month," Schrager says. Keypunch students associated with Grumman get a 10% discount.

The Programming course will begin October 2. Free placement service is offered, although a job is not guaranteed. For information call LR 5-2095.

On record. Vice President William Keye of Control Data Corporation, who participated with Grumman in establishing ATC at Calverton, presents Senior Vice Persident Corky Meyer with plaque commemorating the achievements of the computer-controlled facility. (Photo by Fred Annette)

ATS team at Calverton saluted for contribution to flight testing

A project begun some five years ago has borne significant fruit, and just a few days ago, an award was made in testimony to the project's success as Vice President William Keye of Control Data Corporation presented a plaque to Senior Vice President Corky Meyer.

Then President Pete Viemeister of Grumman Data Systems placed the plaque in the lobby of Calverton's Computing Center. It was more than simply a ceremony; it signified that the enormous power of today's computers is now directly aiding the flight-test analyst when he needs help the most—during flight missions.

The idea for the system was conceived in 1967 and, in '68, Grumman Aerospace awarded a contract to Control Data for equipment to support something new, the now familiar ATS (Automated Telemetry System). The basic aim of the system is to have real-time flight-test information about every aspect of an aircraft's structural, propulsion, and dynamic behavior.

Because of the ATS, engineers seated at a number of consoles can schedule a lot of objectives per flight and expand an aircraft's flight envelope very methodically as the results from each maneuver are plotted on cathode-ray tubes in real-time. The benefits are many: reduced data-processing time, shortened span of flight-test time, increased flight safety, and reduced flight-test costs.

At the hub of the action now for Grumman Aerospace are Tom Kastner, who manages flight-test utilization; Roy Mongelli, who handles business aspects, and Dave Carpenter, who takes charge of technical details. Grumman Data Systems' Ray Le Cann directs the Computing Center with the help of Dick Ahders (business aspects), George Miller (systems development), Lyn Wilson (test data programming), and Paul Arieti (operations details). As Le Cann says:

"Never before have we been able to support test flights of a prototype vehicle with every piece of significant data available to the team during an actual flight itself. Prior to the ATS, it took two weeks to provide final test data on **one flight alone.** Now, for the first time, human endurance is the major limitation in flight testing. We're now able to take advantage of extended periods of flight from refueling to permit safe testing at rates that were unattainable previously."

Le Cann went on to observe that the Company's ATS "is providing the F-14 flight-test program with the means to reduce the duration of the development cycle and, in addition, cut costs."

Ex-Service group

Monthly meetings for the Grumman Ex-Service Men's Club will resume on Wednesday, Sept. 6 and will take place the first Wednesday of each month in Plant 28 auditorium at 7:30 p.m.

Members held a picnic for one of the wards at Northport Veterans Administration Hospital August 23 with the hospital Women's Volunteer Corps. For St. Albans Naval Hospital, donations have continued.

OBITUARIES

Plane News has received word that death has come to the Grumman personnel listed below. We extend sincere sympathy to relatives and friends.

HAROLD SMITH of P/S Program Staff, Plant 30, died July 25. He was 52 years old and had been with Grumman 30 years. His home was at 932 MacArthur St., Bohemia.

GEORGE J. MOORE JR. of Flight Data in Plant 4 died July 30 at the age of 41. He lived at 11 Plymouth Rd., Massapequa. He had been with Grumman since 1958.

Hart, completing summer stay, looks forward to 'city' career

Mike Hart is a person interested in making a community a decent and safe place to live in.

Mike has been doing his internship at Grumman for the past three months in Business Development. He is a graduate student at Georgia Tech in the field of City Planning and Public Administration.

He is especially interested in this field because of his background: he himself grew up in Harlem. There he lived in the ghetto where he was exposed to crime, overcrowded conditions, poor educational facilities, lack of sanitation, medical services, and so on.

"The minorities and poor people are being used," he said. "They don't know the steps to take to get streets paved, proper sewage systems, parks, better educational facilities, or more efficient police protection." According to Hart, city planners do not give a balance of planning to all neighborhoods. "It takes riots, protest marches—and possibly even deaths—before anyone will make a positive move for the minorities, people living in poor neighborhoods. As long as we're quiet, nothing will be done."

Mike is intelligent, with drive, and is intent on pursuing several goals. "I plan to have my Master's and my law degree before I am 30," he says. He hopes to earn his Master's by June of '73, which gives him three to four years to earn his law degree. Other avenues he plans to pursue include teaching political science and African courses at the University of Georgia and later achieving a doctoral degree in Public Administration.

Cites vital need

Mike believes there is a vital need for city planners, but at present he sees new planned communities as a very "dull market," primarily because there are no funds available. "I see new communities as a viable market; they can live, they will be moderate but nothing comparable to the speculative areas of single family homes or home buildings."

New communities, in his opinion, are "planned communities" for all types of people with all income levels. At present, Mike sees a lack of willingness on the part of the Federal administration to get involved as far as legislation is concerned.

Some aspects of city planning are working, Mike says, but again he sees no great effort on the part of the present administration to provide certain guarantees to the developers, such as funds necessary to cover the cost of development.

Mike is 26, single, and not considering marriage in the near future: at present he has too many goals to pursue and he must find out what he **really** wants to do. He admits that half of his goals have been changed. He gives Grumman a certain amount of credit for that. He expressed his appreciation for the opportunity to see how a defense corporation works. "I have been exposed to a wealth of information while working here—information that I would not have been able to gain in a classroom. I have received mixed reactions from different

Mike Hart
Man in a hurry

people about certain things at Grumman, some things which are uncommon to me and quite characteristic of other corporations.

"The work I considered challenging; I had never done anything before on a national scope with national issues. My previous involvement has been from my reading and my grasp of it in school."

Mike has completed his major assignment on city planning at Grumman and he has also ended his internship here, which fulfills a major requirement for his degree. "I'd like to think it was favorable. I'm sure we're never going to be able to please everyone, nor is that my intention. I must retain a certain amount of individualism, but by no means am I so aloof that I cannot relate to groups—as long as that group does not violate very strong, inborn thinking of an individual, or as long as it does not dilute him or make him a 'yes' man, or a 'go along with the plan' man. To be able to make individual contributions is essential because it is in the best interest of the group that an individual be able to fully express himself."

Mike admits that he has been with Grumman much too short a time to make any real value judgments. At the present, "things are just getting warm, yet," he said, "I feel satisfied at the present."

He isn't considering returning to Grumman on a permanent basis, though. "At the present I would not come back because of other options that have been open to me since May and have been taking shape since. Then too, I have one more year in school and during that time I plan to make many decisions."

(This article was written by Linda Logan, who is attached to the Plane News staff and is participating in the Grumman co-operative education program with colleges. Linda will be going into her senior year when she returns to Bennett College in North Carolina next January.)

Time to enroll

Application forms and updated general rules on the Grumman Tuition Reimbursement Program are available at Employee Services and field base administration offices.

service milestones

35

Howard E. Fuelling, Ctls. (2)
Lester F. Quarry, Trans. Ofc. (20)
Hermann Hoffmann, Mfg. Test Plts. Mgmt. (27)
Walter Jankowski, Tech. Staff (30)

30

Harold F. Schaal, Fuse. Fwd. Sub. & Maj. (1)
Murray A. Cohen, Crit. Mat'l Ctl. (1)
Walter J. Karpinski, PPO - F-14 (1)
Thomas La Cascia, Sma. Pts. Fab. (2)
Frederick G. Cassari, Marsh. & Fin. Tool Ctl. (2)
William Rauh, Facil. Maint. (2)
Herbert J. Loromer, Repro (2)
Andrew J. Pryor, Chem. Mill (3)
Charles N. Bell, Maint. Waste & Dispos. (3)
Simmie O. Dean, Maint. Waste & Dispos. (3)
James A. Reardon, Plt. Stores (5)
Anthony T. Masi, Maint. (12)
William H. Ammarell, Avionics Prod. Mgmt. & Staff (14)
Peter C. Hehl, Cent. Prop. Disp. (17)

25

Virgilio Cagna, Grumman Corp. Audit Staff (30)
Louis M. Viviano, Router & Shear (2)
John Vengroski, Alodine (2)
Michael Calamita, Heat Treat (2)
Peter Wladyka, Ctls. (2)
Walter A. Brewster, Ctr. Sect. Final (2)
John Miranda, Stress Relieve & Hot Form (2)
Joseph Bascone Jr., Dispatch (2)
George H. Schalck, Mach. Shop (2)
Walter Stokey, Honeycomb Final (3)
Robert M. Sherman, Jigs & Fixtures (3)
George M. McGunnigle, Out-of-Prod. Spares (4)
Arthur H. Sturm, Plt. Prot. (18)
William K. Neumann, Mfg. Test Plts. Mgmt. (27)
James E. Wells, Person. Adm. (28)
Anthony R. Morace, Stock Ctl. -Mgmt. & Staff (30)
Joseph F. Bruno, Claims & Adj. (30)
Alfred J. Fenn, P/S Pricing (34)
Russell W. Swass, P/S A/C Sys. Serv. (76)
Nicholas De Jesu, P/S A/C Site Mgmt. (90)
Joseph D. Compitello, P/S Fld. Mat/Mod. (94)
Fred J. Berlenbach, Convent. Mach. (5)
Arthur R. Piampiano, Static Test (5)
Anthony S. Durka, Static Test (5)
Claremont C. Jiran Jr., Aero Test (5)
Michael J. Cappiello, Ctl. Recvg. (24)
John Razzini, Repro (25)
Stanley Wondolowski, Fbgl. (27)
William R. Thompson, Ctr. Sect. (27)
Marvin C. Weil, Prod. Rel. (27)
Peter Vitale, Rqmts. Plng. (30)
August C. Sarrantonio, Ctls. & Mech. (30)
Donald W. Bone, Struct. Anal. (30)
Lawrence A. Warner Jr., Elect. Fab. (33)
Neil J. Lockwood, P/S A/C Sys. Serv. (80)
David Scheuer, P/S A/C Sys. Serv. (86)

20

William R. Mytko, Final Assem. (1)
Harold H. Kerr, Alodine (2)
Philip Schreier, Steel Pts. Assem. (2)
Thomas Russell, Wing Inner Pan. (2)
Donald M. Valentine, Hyd. (2)
Peter Taffner, Hyd. (2)
Alfred N. Martin Jr., Prop. Test (2)
Edwin Thomas, Prod. Ctl. (2)
Christopher Maragakes, Ind. Eng. (2)
Edward H. Watson, Jig Details & Sub-Assem. (2)
Donald B. Weaver, ECO Sys. (4)
Jacob J. Comiskey, Dispatch. (2)
Wolfgang J. Nauke, Facil. Maint. (2)
Joseph E. Zaremba, Facil. Maint. (2)
Marie Crescenti, Food Serv. (2)
Leonard Miller, Insp. Mech. (2)
John Balke, Alodine (3)
John A. Greene, Alodine (3)
Harris B. Dodge, Alodine (3)
Delmo D. Da Voli, Spotweld (3)
Albert G. Kaval, Spotweld (3)
Doctor B. Crews, Wing Sub-Assem. (3)
Daniel A. Moore, Wing Final Assem. (3)
Henry P. Gage, Meth. Eng. (3)
Bradford Ellison, Plt. Stores (3)
Margaret Hardick, Food Serv. (3)
John A. Glaser, Insp. Mech. (3)
Paul P. Thiergardt, Final Assem. Struct. (4)
Martin F. Ward, Plt. Stores (4)
Robert Murphy, Supp. Equip. Prod. (5)
Ralph E. Schneider, Environ. Ctl. & Test (5)
George J. Leloudis, Elect. Repair (5)
Edward J. Happ, Adv. Aircraft Sys. (5)
Hector F. Pemberton, Hyd. (6)
Frank Posillico Jr., Final Assem. (6)
Louis Vitello, Preflt. Finals (6)
Herbert Podeyn, Preflt. Finals (6)
Ada M. Martens, Prod. Ctl. (6)
Louis Rios, Facil. Maint. (6)
Elsie G. Mischuch, Repro. (6)
John L. Russell, Elec. Prod. Eng. (7)
Sidney Hale, P/S Struct. Mech. Eng. (15)
Matthew Macchio, Sub. Sys. Com. Relia. App. (15)
Victor Rongo, B/P Whses (21)
George M. Myers, Proj. Eng. (25)
August Lopes, Sub-Assem. (27)
Edward Whek, Fuse. Join. (27)
George C. Trotta, Sub-Assem. (27)
Harold E. Smith, Rqmts. Plng. (30)
Chester E. Downing, Pricing (30)
Daniel A. Vignati, GSE Mech. (33)
Alexander P. Kinkella, Elect. Fab. (33)
Richard F. Goodwin, Flt. Avionics (33)
William F. Walsh, Elect. Repair (33)
Helen Dunn, Repro. (33)
Charles D. Warren, PPO - A-6 (34)
Bruno J. Germano, Alight. Gear (34)
Richard E. Kopp, Sys. Sciences (35)
Bernard H. Waag, Drafting (33)
John Simpson, Ctr. Sect. (36)
Robert J. Allen, Mech. Struct. & Proto. (36)
Hurlow W. Henle, P/S Train. Proj. Mgrs. (39)
William Brock, Ctl. Install. (55)
Frank Laurito, Indust. Eng. (77)
William F. Brownson, KSC LM Oper. Mgmt. (83)
Thomas E. Lawrence, P/S A/C Site Mgmt. (90)

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Ralph Warren, Join & Mid Mod. Install. (1)
Frank Steininger, Final Assem. Struct. (1)
Joseph V. Averso, F-14 Prod. Ctl. (1)
Edward V. Scicchitano, Pwr. Plt. Des. (1)
George F. Albert, Convent. (3)
Henry Meyer, Convent. Mach. (3)
Joseph H. Becker Jr., Chem. Mill (3)

(Continued on page 11)

L. M. Viviano | J. Vengroski | M. Calamita | P. Wladyka | W. A. Brewster | J. Miranda | J. Bascone Jr. | G. H. Schalck | R. M. Sherman

G. M. Mc Gunnigle | F. J. Berlenbach | A. R. Piampiano | A. S. Durka | C. C. Jiran Jr. | M. J. Cappiello | J. Razzini | S. Wondolowski | W. R. Thompson

What a way to treat an airplane:
Destroy Tomcat at Plant 5 to assure its survival

No F-14 flight aircraft will ever be subjected to the fierce, methodical beating that three ground-test vehicles in Plant 5 are now undergoing.

There are different ways of phrasing it, but the reason for this ground-test punishment can be stated simply: to make certain that the Tomcat is "stronger" than required in the flight environment. If the Tomcat can survive the chamber of horrors in Plant 5, which is designed to make survival ultimately impossible, then it's more than ready to handle its prospective Fleet missions.

Fundamentally, three different but related kinds of structural tests are involved in demonstrating that Tomcat is able to perform its air-superiority chores: static, fatigue, and drop tests. "And, as planned, our test program is well ahead of the Program flight-test pace," says Jack Snyder, director of Engineering Development Test Operations. "That means that those ground-test vehicles will have been tested to the extreme well before the aircraft gets into the operational environment. It has to be that way because no flight test can be run unless its comparable ground test has been checked out fully and approved. In other words, we can (and would) stop any flight test point if it hadn't been proved first through ground testing."

Nothing says more about how critical ground tests are.

Mil Griffiths, who heads up Structural Test, describes the nature of static, fatigue, and drop tests in simple terms. "In static tests, we apply loads incrementally, that is, step by step, each load higher than the preceding one. Fatigue tests are what they indicate—measuring structural resistance of a specimen to repeated cycles of stress. And in drop tests, we pick up an entire F-14 with a 30-ton crane and raise it higher and higher, in different attitudes, and drop it on a calibrated platform that measures loads."

Dramatic drop

Of the three, of course, the most dramatic is the drop test. Usually, a lot of people are on hand to witness the drop, though most of them have seen comparable tests before; for there's a peculiar fascination in seeing a fully weighted Tomcat (52,000 pounds of it!) hanging some 10 or 12 feet above the platform—and having it suddenly cut loose to slam onto the platform (with some rebound). And as the aircraft lands, its tires spinning at simulated landing speed, some 120 measurements are recorded by the data acquisition system that's perched on the balcony overlooking the static test area.

This new Grumman Data Systems acquisition center is reputed to be the best such system in the country and twice as accurate as the one formerly in use. According to Rich Romaneck, Instrumentation Test engineer for F-14 and the station operator, it's possible to replay a magnetic tape and get data plotted in meaningful engineering units, thereby saving money and time. "The system can digest an astonishing amount of data," says Griffiths. There are 600 channels each for static and fatigue tests, and 200 of those in each case can be used for data display. There are 120 channels for drop test information. And it's possible to have all channels—static, fatigue, and drop—running simultaneously.

"Not only that," Griffiths says, "a full review of 120 channels can be accomplished in an hour, and an 'on-line' review of a limited quantity of data can be done quickly, permitting fast engineering decisions. This load-control system has no peer."

Drop testing began in April of this year, following a year of static tests. In roughly the same time frame, another prototype aircraft was also being used for static tests. These parallel test efforts made it possible to do the static-test job in half the normal time—a commitment we made to the Navy when we won the F-14 contract. This was the key to BIS (Board of Survey and Inspection) trials in half the time.

Landing-gear test

By the end of this month, about 380 drop tests will have been done (with 180 to go) and the metering pin will have been developed—a critical item. The importance of the metering pin, and its developmnt, is explaind by Jerry McFarland:

"The main purpose of the drop tests is to demonstrate the strength and operation of the landing gear and its supporting structures, which we do by simulating actual landing conditions. That job gets tougher and more complex because as planes fly faster there are going to be harder carrier landings. This makes development of the metering pin increasingly important because the pin controls the shock absorbing characteristics of the landing gear.

"The landing gear mechanism, including the pin, is cushioned by oil. As the plane lands, the oil is driven up the landing gear, past the pin, which acts as a partial barrier to the oil flow. The job is to design the pin in such a way that just enough oil can pass through the gear—that is, retard the flow of oil—to cushion the force. It takes quite a bit of precise designing on a trial-and-error basis to come up with the pin—the one that does the best job."

In addition, says McFarland, tests must be run to determine servicing limitations. What happens, for example, when proper oil levels aren't maintained? What if the level drops to 50 percent? Or 15 percent? Of course, in each case, there's one way to answer the question: drop it and find out.

"A lot of people have the false idea that our drop tests are about the same as drops done in other aircraft categories," remarks Joe Traina, who heads drop test activity. "That just isn't so. In the case of the F-14 you have to have about four times what it takes for a civil or Air Force plane of similar gross weight because carrier landings are four times tougher based on energy (mass in motion). So there's a real need to get a pin that absorbs the most energy without exceeding design parameters. You have to remember that the landing gear acts as a single-shot heat engine: it translates mechanical energy into heat energy."

Traina also points out that the drops are done under various conditions, such as, pitch, roll, asymmetrical (say, 18 degrees), differing aircraft weights, and differing simulated aircraft speeds. And fairly soon, the plane will be "converted" to accept the B engine, and then another static test series has to be run. That's to end next May.

Breaking up . . . on purpose

To get back to the two prototype aircraft designated for static tests, Griffiths says that "The first static article has gone through static testing to design-ultimate successfully and is now going through wing loading, a failing load series designed to break up, selectively, specific parts of the aircraft. The failing margins as established by test enable the engineer to know what available over-strength there is to be used. The static tests tell me half — just half — of the story. The other half is mission designed life."

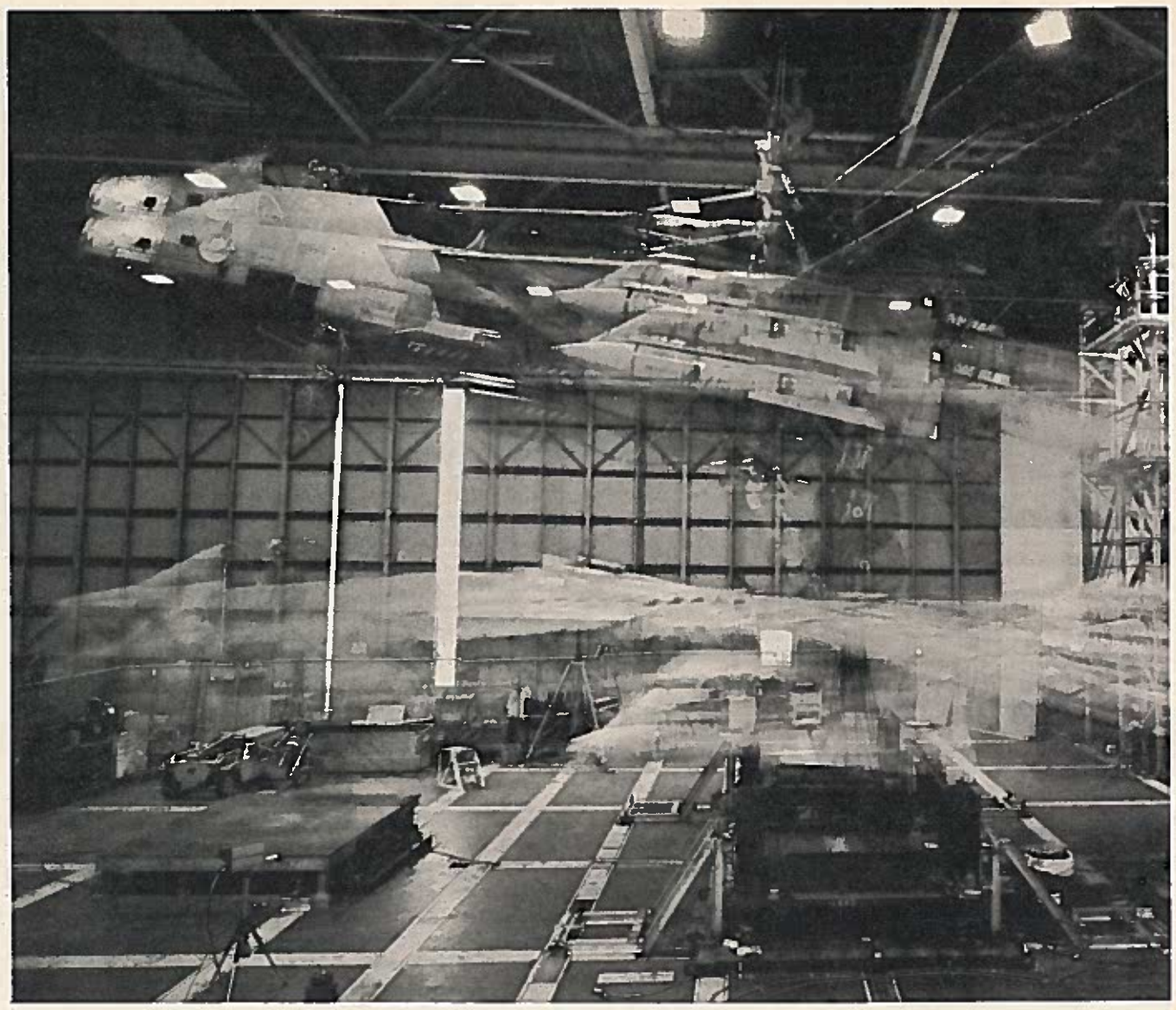
Of course, well before any of these tests occurred, wind tunnel tests of a model of the aircraft had been made. These were not full scale models, and they, too, told just a portion of the story. The readings an engineer sees from a one-tenth-scale model cannot possibly be as accurate as those he sees with a full aircraft. This is not to say that wind tunnel tests are useless; far from it; they provide the gross parameters, which the design engineers refine later, using the test materials (e.g., boron, carbon, titanium) that are to be in the plane. Then, after the design stage and during early production—while ground testing is in process—the designer must have some time to produce a minimum-weight structure. Ideally, as planned in the case of the F-14, the static tests begin well before flight tests are planned. In that kind of design and ground-test flow, two things happen: (1) ground tests are way ahead of production, thus (2) enabling redesign to be rapid without "throwing away" a large and costly amount of materials, parts, and subsystems. So, as a consequence, the static aircraft are validated very early . . . and "crabs" are caught early . . . and the expanding envelope of flight tests comes sooner than ever before.

While S-1 is undergoing wing loading to determine where and when fractures may occur, in the adjoining area there's a fatigue aircraft. The "guarantee" on that plane is for 6,000 flight hours, but since the fatigue aircraft will not see the flight environment, the guarantee is doubled to 12,000 simulated flight hours. "So, we guarantee 12,000 hours on ground test and then we'll shoot for four-times life, or 24,000 hours. This factor of four-times life, by the way, is in the contract. It's there to provide the Navy with 'life extension' of the Tomcat," says Griffiths.

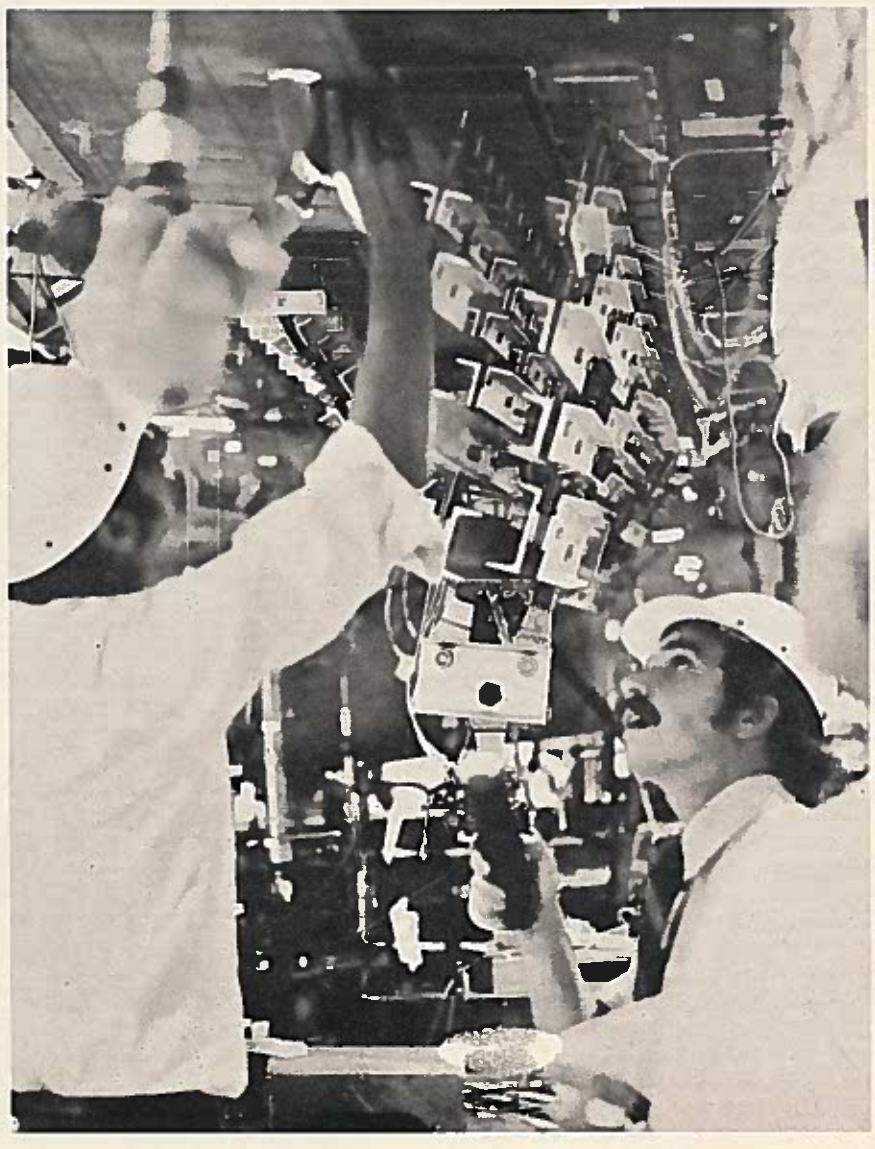
'Finest degree possible'

The control system for the fatigue tests is a closed-loop servo-system that keeps proper pressure in the hydraulic loading cylinders. The mechanism, says Bob Hess, load control engineer, employs a punched paper tape, and inputs go to the computer through 60 channels. Monitoring, then, is fast and accurate; and there's even a built-in error-control system.

"The heart of this whole effort, as you see, is simulation," Snyder comments. "We simulate to the greatest and finest degree possible before a hardware commitment is made—all for the sake of being sure things are going down the right path. Missing the path is costly and time-consuming, and well-done ground tests help to avoid that. All of us know there's nothing tougher to handle than a high-bred filly, and that's what the F-14 is. So the word is, simulate, simulate, simulate. That's just what we've done and what we're doing—and that filly looks beautiful!"



To test a plane on the ground by simulating the stresses and strains and poundings it will be exposed to in the real flight environment — and then going well beyond that environment — is the safest and most certain way to guarantee its structural integrity. Here, photographers John Boles and Carl Lassig capture some of the action — checking the landing gear and applying loads on wings (left page) and, clockwise from top, monitoring tests, drop-testing a full aircraft, checking load build-up, and running the 'spaghetti' (lines) in the test article.



Monopoles streaking, smack Godsons in 12-8 comeback win

It could be said that the Monopoles in the Monday night American league teem with poorly concealed aggressions that they're willing to take out on any softball squad that has the temerity to get in their way. A ferocious gang without mercy—a sly group that entices opponents into a false sense of security—that's what they are. Sort of bushwhackers.

A case in point: the Godsons. They stormed the sentry at the first-inning gate, picking up six runs, and squeezed through the barricades for two more tallies in the second. So they were 8-0 over the Monopoles, who slept for the first three innings. Then the Monopoles' cannons opened up to pound out three runs in the fourth, two in the fifth, three more in the sixth, and four in the seventh—and there is was, a 12-8 win. A triple by Ed Gabriel, a double by Joe Alario, three singles by Mickey Rowles and two by John Wallace helped the Monopoles considerably.

Then the Vikings came in, and the Monopoles changed their tactics. Why, they asked, play possum? They let loose with a vengeance, Wallace stroking a four-bagger and a triple, Bob Ogilvie slamming a homer, Bob Savasta and Deac Rogers hitting triples, and Rogers and Bill Diercks chipping in with doubles. And what about the Vikings. who'd knocked off the Monopoles in the play-offs last year? Well, they came in on the short end of a 20-4 score. That's six in a row for the Monopoles with no losses. One imagines signs and banners all over the place reading "Break up the Monopoles!" Sure.

Some days . . .

The Dingbats of Monday National play shoulda stood in bed, as the old saying goes. They tried, twice; they lost, twice, both times to Research. It was a double-header loss, and how that must have hurt, 'cause they'd been undefeated. C'est la vie. There were three out-of-the-park blows, by the way, all from the bats of the Researchers, John Brook with one on and solos by Chuck MacLaughlin and Ray Larsen.

Simulation keeps pounding along in the Tueday American. They unceremoniously slapped down the Druids 14-3 as Bruno Sidor went on a rampage, banging out a homer and two doubles, and Glenn Spacht doubled. They treated the Jets inhospitably, too, as Sidor (he's a tiger!) and John Wallace tripled and Ed Gabriel drove one out of the park. The Jets got a little of their self-respect back, though, in a game against the put-upon Druids. No pitching match, this one, as the Jets pounded out 22 hits on their way to a 16-8 victory. The name of the game for the Jets was Homers Galore — one each came off the bats of Brian Scheu, Mike Feola, Chuck Hess, and Marty Martinez. Hess and Feola each had a triple, too, and Scheu stroked two doubles, Mickey Rowles did the same, and Tom O'Connor hit a double. (A mention to pro scouts lurking in the stands: Scheu's sporting an incredible average of .645.)

Since they're driving everybody else up a tree with their 9-0 won-lost record, let's chat about the Woodpeckers. They had a close one recently, a 15-13 wingding more like hand-to-hand combat. A sort of mini-miracle was involved here. The Woodpeckers had a 15-10 lead as the Hellcats came up in the bottom of the seventh, and bang, bang, bang! The Hellcats got three runs in, had two aboard, and none out. The score card notes simply, "Good left field plays by Bob Ogilvie." Good? They must have been brilliant.

Anyway, with that scare behind them, the Woodpeckers went on to their ninth victory, humbling the Campbell Kids, 14-3. In that one, George Cumberland belted two circuit clouts and Bob Ogilvie and Charlie Esposito each hit one. Those inclined to mourn have their chance; the Campbell Kids are now 1-8.

Joltin' Joe

The scrappy Hellcats, manfully brushing aside their close loss to the Woodpeckers, attacked the Talons, and with a three-run four-bagger by Joe Urquhart, a solo by Tony Marchese, triples by Artie Grey and Jim Sharp, and doubles off the bats of Marchese and Bill Alemaghides, they romped to a 19-5 win. To show that they can field as well as hit, the Hellcats also pulled off four double plays.

Then there's the story of the Mohawks and the Condors locked in competitive embrace, each with four wins and four losses. Now for sheer excitement this one had to be a beaut! It was the Mohawks, 21-1, then a 2-2 tie, then 3-2 (Mohawks), then a four-run outburst by the Condors gave them the lead, 6-3, so the Mohawks tied it up, only to be victimized by another four-run barrage from the Condors. But the Mohawks picked up three runs in the sixth and two in the top of the seventh to go ahead 11-10. The Condors came up for their last chance . . . and pushed over two runs to win it. If both teams didn't leave the field exhausted, they must have taken stamina injections.

Something strange happened on the way to the game . . . during it . . . and at the end. How often this sort of thing has occurred in the past we do not know, but those whose passion it is to log in trivia and/or records, well, on the early evening of August 2, the Jammers and Black Diamonds gathered for a big-roundball game. The startling oddity was this: it was a real honest-to-goodness pitcher's duel. Really. After the full game the score was Jammers 2, Black Diamonds 0. . . . On the same day, something more true to form—this, too, in Wednesday play.—was going on: the Hi-Balls met the Egg Beaters and whipped them into an omelet, 27 to 5. You may have guessed that out of this mayhem there emerged some hitting stars: two homers by Don Kump, a triple by Lou Marinelli, three doubles by Tony Bianchini as well as one by Marinelli and another by Al Trabold. Also, Don Anselona punched out five successive singles.

'Cats on prowl

Also in the Wednesday National, Bob Schmidt of the Digits crashed a homer, but all in vain as the Tomcats, showing an excellent defense, triumphed, 4-2. The key to the win was a sparkling play at third by Joe Brenner in the first inning that held the Digits to a single tally. . . . The Tomcats later cut down the Black Diamonds in an 8-4 win. Gordon Woodruff's homer helped, as did a spectacular catch by right fielder Marty Fleming that quashed a fourth-inning rally by the Black Diamonds. It was a tough one for the Black Diamonds, who earlier had been hanhandled by the Digits, 20-5.

The Hits were making them in the Wednesday American—11 of them, in fact—and had three men cross the plate in the first inning. That in itself did in Charlie Brown's All-Stars as the Hits won, 4-1. The week before, the Hits got 12 runs on 17 base knocks, including round-trippers from Joe Osche and Hal Roth, and just sneaked by the Q Dots with only run to spare. Nor was that all the pain the Q Dots were destined to suffer: a week after that, they bowed to the Side Lobes, who trimmed them 9 to 7 (partly on the strength of homers by Joe Vosefski and Joe Alario); and one week later, disaster really struck them as they were bombed 25 to 1 by the Mini Jets. The Mini Jets had a field day as Tom Ramberg, Brian Scheu, Mickey Rowles, and Marty Martinez poked home runs. Ramberg was hot, smacking a triple, double, and single as well as the circuit clout. Bob Metz, Sheu, and Rowles also drilled doubles. It wasn't quite that easy the following week, though the Mini Jets won again, this time 21-13 over the Sloe Pokes. But what an awesome display of power the Mini Jets put on! Marty Martinez, Al Grillo, and Bob Metz each homered twice. Teddy Wess' four-bagger almost seemed anemic, The Mini Jets, by the way, sport a 7-0 record, and it's easy to see why.

The Shadows stole silently past Research in the Thursday invitational play and showed Research that they are substantial indeed. Al Grillo pumped one out of the park, so to speak, and Ed Gabriel tripled—two of the five men who could boast of banging out three hits during the game—as the Shadows set down Research by an 11-6 score. In the semi-final playoffs, the only extra-base blow was a double hammered by Mike Ottone of the Shadows, who defeated the Rangers, 9-3. Fourteen singles properly placed can obviously get the job done. . . . In Nite Owl play, Machine Shop, Plant 3, defeated the Flyers on two successive nights, first by 25 to 24 and then by 11 to 5. Total hit production — 84. . . . In the lunch-hour league at Plant 7, Art Donato went three for three and Joe Barsczewski, Pete Howell, and Bill Hochner all had two for three as Flight Development capped a 4-3 win over What's Left. When Flight Development tackled with the Metsfits, though, 'twas a different, sadder tale as they lost, 10 to 8. . . . In 12:30 action at Plant 2, the Leakers bopped the Commanders, 8-3. Eli Gunther, a pitcher, won the big slam honors with his homer.

Handball, 'shoe, court players have till Sept. 8 to submit entries

Anyone for handball? Paddleball? Horseshoes? Well, get in line, quickly; the annual tournament that involves these three games starts Monday, Sept. 11.

The way to get into the competition is to complete the accompanying entry registration form and send it to GAA (Grumman Athletic Association), Plant 30. Paddleball, by the way, is set up for doubles only.

Play in both handball and horseshoes will run Monday through Friday starting each day at 12:30 p.m. The 'shoe competition will be at the Plant 3 courts, handball at the town park adjacent to Plant 30.

Herb Mahoney will oversee handball play and Mike Cherry will supervise the horseshoe matches. In addition to this Bethpage action, separate events are planned for plants in Garden City, Syosset, Wyandanch, and Calverton.

All applicants who register for the tourney will receive further instructions from GAA as to time, location, and tournament rules.

Tournament Entry Registration

Paddleball ..... Horseshoes ..... Handball .....

Singles ..... Doubles .....

Name ..... Ext. .....

Plant ..... Dept. ..... Perm. No. .....

Doubles Partner

Name ..... Ext. .....

Plant ..... Dept. ..... Perm. No. .....

Entry Deadline Friday, September 8
(Forward to GAA office, Plant 30)

Hold tight. **Here we have Burt Reynolds and, in bow, Ned Beatty conquering the Chattooga River of Georgia in a Grumman canoe. A boisterous sequence was shot for a John Boorman movie, 'Deliverance.' You've heard of, or seen, Burt Reynolds in, er, a ladies' magazine?**

Grumman canoes prove a point

Even the seasoned stuntmen who accompanied stars Jon Voight and Burt Reynolds and producer-director John Boorman into the woods of northern Georgia had second thoughts about doing battle with the white water rapids of the wild Chattooga River. To film the motion picture 'Deliverance,' a whole armada of personnel and equipment was brought in—including Grumman aluminum canoes. Two of the other canoes used in filming were dashed to splinters, and jagged rocks slashed the bottoms of at least six rafts.

Not so the Grummans. After three months of filming, these emerged undaunted. One member of the crew even tells about struggling to add a few dents to the Grumman canoe used in the final sequences.

GAA schedules 'kickers' tourney for Sept. 28 at Bethpage Park

The annual GAA championship and kickers tournament will be held Thursday, Sept. 28, on the Blue course at Bethpage Park.

The event is on a first-come, first-served basis with the field limited to 80 golfers. So if you want to play in the tourney, register now with Mike Cherry of GAA, Plant 30.

The entry fee this year is $12.50, which provides for greens fee, reserved starting time, a crack at a variety of prizes, and a buffet dinner with beer at the club house. There will be low-gross prizes for men and for senior division (over 50). The net for men and women, and kickers' prizes, will be decided by the Callaway handicap system. Those eligible for the senior division should inform Cherry at the first tee as to whether they want to compete in that division.

Only one low-gross or one low-net award can be made to one person. Trophies will be awarded for low-gross and low-gross senior, low-net and low-net senior, second low-gross, and second low-net. All prizes will be awarded after the buffet dinner.

To assure smooth flow, Cherry suggests that, whenever possible, golfers should sign up as foursomes and appear at the first tee one-half hour before scheduled tee-off time. If you have questions, call Mike on Ext. 2133 or 2269.

Varsity golfers do it again . . . and net squad not far behind

The Grumman golfers have done it again!

The team, which plays in the Long Island Industrial Recreation Association, has captured another championship — their eighth in a row. And it was done with relative ease as they chalked up seven wins and only one loss.

In the first round against Photo Circuits, Tony Cisco and Ken Prager came in with a three-stroke lead. The only birdie was Cisco's on the 14th hole of the Black course, where he carded a 2.

Then the team of Bill Bartoszak and Roy LaRosa went on to sew up the championship.

It's happened: a Grumman tennis squad has lost!

Hang no crepe, shed no tear. After all, it was inevitable; the competing teams were both from Grumman. At Hempstead Lake courts, the Grumman A team battled the B team in a close match, and the A contingent squeaked to a 2-1 win. All matches went to three sets as John Hsu and Bill Wenzel dumped Andy Kaufmann and Dick Berman, Bob Bentler and Gerry Fogel lost to Jacques Crouzet-Pascal and Jay Leng; and Dave McKendrick and Joe DiStefano downed Don Bohling and Dick Reade for the Bs only win.

Earlier, the A racquet squad swept to its ninth and tenth consecutive victories, first defeating Photo Circuits, 2-1, and then rolling over Pfizer, 3-0.

Record breaker

"Holy cow!", "How about that!", and all other such superlatives are heard at one time or another. Ned Kesin probably deserves them all after his recent effort in the Rainbow Summer Mixed loop at Syosset Lanes. Ned forged a glittering 693 with help from a 279, both, of course, records in the league.

John Jezewski picked an inauspicious time to register a 231-603—after all, who notices that when a 693 was at center stage. Others scoring well in recent Rainbow play were Helen Murtha, 494; Barbara Abrami, 484.

On target

Phil Boehm of Plant Protection recently competed in the U. S. National Pistol matches held at Camp Perry, Ohio, and placed second in the Police/Sharpshooter class. In the "Warm-up" matches he fired a 281 with a .22, 269 for center fire, and 266 with a .45 for a three-gun aggregate of 816.

Separate tables

To boost the Grumman Duplicate Bridge Club into orbit for the fall season, special attractions are being offered. On Thursday, Sept. 7, in Plant 3 Cafeteria, players are invited to a session of free instruction at 5:30 p.m., free duplicate game and free refreshments at 6:30. "Everyone is welcome. Bring guests. Partnerships arranged," says Dan Panshoukian, Ext. 2798.

service milestones

(Continued from page 7)

Nicholas V. Descetto, Chem. Mill (3)
William R. Brown, Assem. Tool. (3)
Paul J. Bach, Convent. Mach. (5)
August K. Kubart, Assem. Meth. & Plng. (6)
Donald E. Fahey, Facil. Maint. (6)
Francis E. Hurley III, QC Lab (10)
Bernard Zyniewski, Metal. & Weld. Eng. (12)
Robert H. Tydeck, P/S Mech. Eng. Mgmt. (25)
Manning H. Dandridge, Proj. Eng. (25)
Franklyn D. Smith, QC Prog. Mgmt. - Space (25)
Leonard R. Godbold, Sub-Assem. (27)
Herbert O. Dettmering, Loads & Crit. (30)
Vincenzo Ippolito, Facil. Maint. (31)
William C. Adams, Elect. Fab (33)
Calvin J. Colonel, Insp.-Supp. Equip. (33)
Richard A. Oman, Fluid Mech. (35)
Raymond W. Single, Tech Ops (77)
Edward A. Calvelli, KSC QC (83)
William C. Coulbourn, ECO Sys (4)

M. C. Weil P. Vitale

A. C. Sarrantonio D. W. Bone L. A. Warner Jr. N. J. Lockwood D. Scheuer

Training and Development offering fall classes . . .

Corporate Training and Development is offering a number of after-hours courses again this semester to help students expand their knowledge and brush up on their skills. Registration is by phone, starting 8 a.m. Monday, Aug. 28 and continuing until 4:30 p.m. Friday, Sept. 8. There are no fees or tuition charges.

The courses listed are available to Grumman employees. For some courses there are prerequisites. Students need not have fulfilled a particular prerequisite by taking voluntary education courses: courses taken elsewhere or work experience can prepare a student for the more advanced courses.

For all courses, a minimum registration of 15 students is required.

Enrollment procedure

Enrollment is strictly voluntary. Students may register by calling the Voluntary Education Office at the extensions listed below. **Please note:** a specific phone extension is assigned for registrations for the day on which a course is given. The extension listed below which is prefixed by an asterisk (*) will be connected **only during the registration period.**

Registration calls will be accepted ONLY from 8 a.m., Aug. 28, through 4:30 p.m., Sept. 8, 1972 each working day.

Bethpage courses:

Monday evening courses - call Ext. 87521*

Tuesday evening courses - call Ext. 87522*

Wednesday evening courses - call Ext. 84413

Thursday evening courses - call Ext. 1282*

All Calverton evening courses - call Ext. 381

To reserve Programmed Instruction Text - call Ext. 84413

Certificates

Certificates will be issued to those students who have attended at least 80% of the sessions and have completed the required work in a creditable manner. Further information can be obtained by calling the Voluntary Education Office on Ext. 84413.

Student cost

There are no fees or tuition charges. However, students are expected to purchase their own textbooks. Textbooks may be purchased anywhere, but for students' convenience, the Voluntary Education Office will have textbooks available for purchase through the course instructor.

A number of Programmed Instruction courses are being offered. As the texts used for Programmed Instruction are not reusable, a flat fee of $5 per Programed Instruction text will be applied. Check or money order must be made payable to Grumman Aerospace Corporation. Programmed Instruction courses may be obtained at the Voluntary Education Office, Plant 39, Bethpage.

The following list of courses being offered by Corporate Training and Development includes title, course number, description of course, section number (if more than one section is being offered), instructor, location and time of class, and starting date. For registration, refer to title, course number, and section (if more than one class offered).

Computer Programming - COBOL (FF 00001 - 30 hrs)

Covers the COBOL language and its application to business problems. Topics to be included are: organization of a COBOL program, fundamentals of flow charting, COBOL language structure and usage, review of compiler diagnostic messages, and class problems.

Prerequisite: Introduction to Computer Programming or equivalent.

Bernard Abrams Room 6, Plt. 39, 5-7 p.m., Mon., Sept. 18.

Computer Programming - FORTRAN (FF 00002 - 30 hrs)

Introduces the basic concepts of a digital computer and how to program it in FORTRAN. Will enable the student to set up problems for solution on the computer using this language.

Prerequisites: Algebra.

Joe Vosefski, Room 110, Bethpage H.S., 5-7 p.m., Tues., Sept. 19.

Computer Programming, Introduction to (FF 00003 - 30 hrs)

Intended for those students who have had little or no exposure to computer programming, and intend to take programming courses devoted to a particular language.

Course includes: philosophies of programming, representation, presentation and transfer of information, problem analysis, program organization, coding and an introduction to FORTRAN, COBOL, ALGOC and PL/1.

Martin Blyseth and Greg Di Benedetto, Room 112, Bethpage H.S., 5-7 pm., Mon., Sept. 18.

Computer Resources Management (for non-EDP managers) (FF 01021 - 30 hrs)

Designed to present computer resource information to non-EDP managers so that they will know what parameters to consider in their decision processes.

Martin Blyseth and Greg Di Benedetto, Room 4, Plt. 39, 5-7 p.m., Wed., Sept. 20.

Manufacturing Methods II (FF 00043 - 30 hrs)

A continuation of Manufacturing Methods. Will cover: tool order, tool route cards, operation sheets, introduction to the automated system of operation, aircraft lines drawings as related to tooling, configuration.

Prerequisite: Manufacturing Methods I or equivalent.

Pat Bernardo, Room 110, Bethpage H.S., 5-7 p.m., Mon., Sept. 18.

Manufacturing Methods IV (FF 01142 - 30 hrs)

Manufacturing Methods IV is a continuation of the series of Methods Engineering functions carried out in Methods II and III. It describes the many tasks which must be understood, to successfully carry out the daily activities of the methods engineering function. It further instructs the student in the use of the systems, forms, and communcation media in performing these functions.

Prerequisites: Methods II and III

Pat Bernardo, Room 9, Plant 39, 5-7 p.m., Thurs., Sept. 21.

Materials Application Engineering (FF 01030 - 30 hrs)

This course is designed to present to both subsystem and shop personnel an understanding of materials selection, materials finishing, and materials joining. This course would answer the question "Why that material"? Often encountered in component design."

Richard Hoffmann, Room 114, Bethpage H.S., 5-7 p.m., Tues., Sept. 19.

Laser Technology (FF 00528 - 26 hrs)

Designed to give engineering personnel an understanding of lasers and laser systems. Lectures on: laser background, types of lasers, nonlinear optics, holography, laser characteristics, laser scanning systems, ancillary system elements.

Prerequisite: Engineering degree

Ken Leib, Conf. Room 1 & 2, Plant 14, 5-7 p.m., Tues., Sept. 19.

Linear Control Systems (FF 00070 - 30 hrs)

For those with an engineering or science degree. Course will include mathematical modeling of linear control systems and analysis of those systems using both time and frequency domain technique.

Prerequisite: Differential Equations.

Robert Quinn, Room 2, Plant 39, 5-7 p.m., Wed., Sept. 20.

Basic Stress (FF 00708 - 30 hrs)

Grumman employees involved in the preliminary layout of structural components are instructed in the elementary methods of stress analysis. Simple calculations that will allow them to size such structural elements as beams, stringers, shear panels, etc. New employees will be indoctrinated in the analysis of thin gage, lightweight components.

Prerequisite: High school math to Trigonometry.

Oswaldo Lourenso, Room 3, Plant 39, 5-7 p.m., Tues., Sept. 19.

Cryogenic Engineering (FF 00710 - 34 hrs)

Introduces basic concepts of low temperature engineering, with heavy emphasis in the use of hydrogen and oxygen technology for both space and earth applications.

Course includes: Thermodynamics fundamentals, properties of materials, vacuum technology, fluid flow, heat transfer, test operations and safety.

Prerequisite: Engineering degree or equivalent.

William Contreras, Room 115, Bethpage H.S., 5-7 p.m., Tues., Sept. 19.

Introduction to Hydraulics (FF 00039 - 30 hrs)

Covers development of basic hydraulic systems, including basic physics which govern fluids, prints, hydraulic fittings, component and lab work.

Grumman helped. Paul Butler, manager of the Calverton Facility, accepts a plaque from Robert J. Cowan of the 'CARE' organization. It was presented to Grumman in thanks for its part in testing a typhoon-resistant house designed for the people of Bangladesh. (Photo by Dick Sander)

with registration scheduled from Aug. 28 to Sept. 8

Prerequisite: Basic Mathematics.

Section I (Bethpage) Elmer Baumgart, Room 3, Plant 39, 5-7 p.m., Wed., Sept. 20.

Section 2 (Calverton) Elmer Baumgart, Room 7, Plant 6, 5-7 p.m., Mon., Sept. 18.

Electricity I (FF 00008 - 30 hrs)

This beginner's course covers the production of electricity, magnetism, d-c circuits, Ohm's Law, Kirchoff's Laws, resistance, series circuits, parallel circuits, use of measuring instruments.

Prerequisite: Algebra, to Quadratics.

S. Biesiadecki, Room 4, Plant 39, 5-7 p.m., Mon., Sept. 18.

Electronics I (FF 00010 - 30 hrs)

Covers power supplies, transformers, filters, voltage doublers, voltage dividers, vacuum tubes, and use of necessary instrumentation.

Prerequisites: Electricity II; and Algebra, Quadratics to Trigonometry.

S. Biesiadecki, Room 4, Plant 39, 5-7 p.m., Wed., Sept. 20.

Writing Proposals (FF 00021 - 30 hrs)

A course for those who may participate in proposal efforts. Various aspects of the proprosal will be analyzed to enable the student to create a well organized document that is responsive to the requirements of the customer. Particular emphasis will be placed on writing mechanics including organization of material, word selection and arrangement and presentation of results so that the writer persuades as well as communicates.

Bill Fleischhauer, Room 111, Bethpage H.S., 5-7 p.m., Tues., Sept. 19.

Electronic Communications Equipment (FF 01025 - 40 hrs)

Troubleshooting and repair of entire radio receiver and associated equipment, including power supply, IF, RF, and audio circuits. Various types of testing equipment will be used, such as the voltmeter, signal generator, and oscilloscope.

Robert Volino, Room 8, Calverton, Plant 6, 4:30-7:30 p.m., Mon., Sept. 18.

Reading Improvement (FF 00020 - 33 hrs)

For the average or above average reader who wishes to read more efficiently. Through systematic classroom exercises, the student will substantially increase his reading speed and comprehension.

George Ballard, Conference Room A, Plant 25, 5-6:30 p.m., Mon., Sept. 18 (Meets on Mon./Wed.)

High School Equivalency (FF 00016 - 60 hrs)

Instruction, review, and preparation for taking the High School Equivalency test.

Areas of concentration: Mathematics, Sciences, English, Social Studies. All applicants pre-tested prior to being admitted to course.

Prerequisite: 18 years of age or older; out of school at least one year.

Howard Brochyus, Room 9, Plant 39, 5-7 p.m., Mon., Sept. 18 (Meets on Mon./Wed.).

Effective Technical Presentations (FF 00019 - 30 hrs)

A course to prepare engineering and administrative personnel to give brief, coherent, and successful oral presentations. Includes tailoring a presentation to a specific audience, organizing material for most effectiveness, selection and preparation of visual aids, platform techniques. Practice presentations and class critiques.

George Breen, Room 9, Plant 39, 5-7 p.m., Tues., Sept. 19.

Integrated Circuits for Engineers II (FF 01143 - 30 hrs)

The course will provide a review of Design Parameters necessary in selecting IC's for High Frequency Application, such as: Video Amplifiers, IF Amplifiers and Tuned Circuits: Application of IC's for arithmetic functions, converters D to A and A to D, is included.

The objectives of the course will be to acquaint the engineer with the interpretation of various manufacturer IC specifications and assist him in selecting the right IC to do a certain job. It will also familiarize him with the limitations of IC's.

Selected design problems will be taken up in class. Application of IC's to Digital Circuits will be emphasized. Familiarization with problems encountered in the use of IC's and how to cope with these probems is also included. The application of FET, MOS and MOSFET, with concentration on practical aspect, such as Voltage Variable Resistor, completes the course.

Prerequisite: Integrated Circuits I (A brief review of Integrated Circuits I will be conducted if necessary).

Section I - Val Sanford, Room 115, Bethpage H.S., 5-7 p.m., Mon., Sept. 18.

Section II - Val Sanford, Room 115, Bethpage H.S., 5-7 p.m., Wed., Sept. 20.

Operation of Business Equipment (FF 01140 - 30 hrs)

This course will provide an understanding of the operation of the following machines: electric typewriter, transcribing machine, desk calculator, adding machine, fluid duplicator and ink stencil duplicator. Depending on ability and effort, it will be possible for a student to develop proficiency on any of these machines.

Bethpage H.S. Instructor, Room 116, Bethpage H.S., Tues., Sept. 19.

Data Processing I (FF 00006 - 30 hrs)

This course covers fundamental concepts of Data Processing. Topics covered are input devices, card formats, and an introduction to the electric machine equipment. Included will be several tours of the Grumman Data Processing Areas.

Robert Plaut, Room 110, Bethpage H.S., 5-7 p.m., Wed., Sept. 20.

Computer Programming - FORTRAN (Advanced) (FF 01141 - 30 hrs)

An integrated course covering the applications and limitations of the IBM 1130 computer system with an introduction to the IBM 360/75 system. Real time aspects of selected scientific and management information will be studied. Students will solve simple modeling and optimization problems utilizing the more advanced techniques in FORTRAN programming.

Prerequisites: First year college math and computer programming (FORTRAN) or equivalent.

Joe Vosefski, Room 10, Plant 39, 5-7 p.m., Thurs., Sept. 21.

Shorthand, Gregg Refresher (FF 00023 - 30 hrs)

For the individual who wishes to refresh or rebuild skills in shorthand. Provides dictation and transcription ,practice geared to industrial requirements.

Marjorie Wolfe, Room 113, Bethpage H.S., 5-7 p.m., Wed., Sept. 20.

Typing, Beginners (FF 00030 - 30 hrs)

For those who desire a skill in typing. Through regular classroom practice and drill, students will acquire the necessary keyboard control essential to good typing techniques.

Bethpage High School Instructor, Room 109, Bethpage H.S., 5-6 p.m., Mon., Sept. 18.

Home Studies

For those who are unable to take advantage of the Voluntary Education Program after normal working hours, the following Programmed Instruction (P.I.) courses are being made available, in limited numbers. These are self-teaching programs. Certificates are awarded to those who complete the course satisfactorily. (Fee $5 per course.)

Pressure & Its Measurement

Liquid Level Measurement - Part I

Improving Your Written Communications

Methods Improvement and Work Controls

The Secretary - Jill of all Trades

Cutting Office Costs Through Work Simplication

Trigonometry - A Practical Course

The Arithmetic of Computers

Sterling performance. **John Maloney, a buyer in General Purchasing, Plant 30, is presented with $75 U.S. Savings Bond by Norm Egloff, manager of Central Purchasing, and Stan Scheiner, manager of General Purchasing. Maloney earned the Project Sterling award for a suggestion that put Grumman in better bargaining position in future printing contracts.**

Grumman reports half-year figures

Grumman Corporation reports a net income of $5,716,031, or $.84 per share, for the six-month period that ended in June. Sales and other income totaled $317,973,057. For the same period last year, the figures were $9,397,562 net, $1.35 per share, and $442,365,606 in sales and other income.

Chairman of the Board Clint Towl attributed most of the decline to sharp cutbacks in the aerospace industry. In Grumman's case, the impending end of the Apollo Program and the tapering off of some military aircrart efforts have narrowed the business base.

No dividend

No dividends have been declared for the past two quarters, and none is expected in the immediate future because the Company has signed an agreement with the Department of Defense for $20 million in short-term financing for Navy programs—an agreement that prohibits the Company from declaring any cash dividends until that debt is settled.

For Rent

APT.: Dix Hills, 1 bdrm., util. incl., male, non-smoker. 667-1143.

APT.: Huntington Vill., lrg. liv. rm., din. rm., bdrm., bath, pvt. terrace, pvt. park., 2 pvt. ent, $250/mo. plus ½ elec. 423-1481, after 5 p.m.

ROOM: Levittown, pvt. ent., furn., gent. pref. GE 3-5569.

ROOM: Farmingdale, semi pvt. bath, lrg. cedar closet. CH 9-2873.

ROOM: Bethpage, pvt. ent. & bath, nr. plt., gent. only. WE 5-7746.

APT.: New studio, comp. furn., Huntington area, walk to bch. 549-1256.

HOUSE: Dingman's Ferry, Pocono Mts., 2 bdrm., use of pools, lakes & row boats incl. LI 1-5177.

ROOM: Baldwin, pvt. bdrm., share liv. rm., kit. & bath, pvt. ent., furn., util. incl., mature gent. BA 3-3822.

ROOMS: Massapequa Pk., furn., pvt. ent. 541-5602.

HOUSE: Holbrook, 3 bdrm., din. rm., full bsmt., att. gar., 1 blk. south L.I.E., avail. 9/1, $300/mo. 732-9074, after 8 p.m.

ROOM: Bethpage, furn., walk to shop. ctr., gent. pref. 822-3819.

HOUSE: Oakdale, 3 bdrm., din. rm., eat-in-kit., att. gar., fenc. yd., util., w-w, air cond., $335/mo. 589-5229.

ROOM: Nr. GAC, new, furn., pvt. bath. 796-8106, after 5 p.m.

HOUSE: Bethpage, 3 bdrm., unfurn., $300/mo., plus oil & elec. WE 5-9353.

APT.: Bethpage, 5 rm., refrig., pvt. ent. WE 5-3821.

HOUSE: Commack, 7 rm. split, 3 bdrm., 1½ bath, fam. rm., bsmt., carpet. & drapes inc., $300/mo. 864-5349.

HOUSE: Bethpage, 3 bdrm. Levitt ranch, lrg. liv. rm., eat-in-kit., lndry., attic stor., air cond., 2 appli., 2 yr. lease. 822-4085.

Wanted

AMPROBE: Volt ammeter, RS-3. JU 6-6878.

FISH. EQUIP.: Salt water boat equip., up to 4/0 & lures. 669-6194.

CAMP. EQUIP.: Propane lantern, refrig., cylinder & conv. hose kit; cab. tent, 12x10, duocom fab. or equiv. for din. canopy, 12x12, tent. trlr. for fam. of 5. HR 3-4477.

HOUSEMATE: Share town house lux. apt., Jericho Tpke. & Seaford-Oyster Bay Express., new furn., room, no restrictions, female. WE 5-7770.

APARTMENT: For young newlyweds, 4 rooms, near Grumman, after 5 p.m. 598-2848.

APARTMENT: Three bedrm., occupancy Oct. 1., three adults. 293-8039.

HOUSE: Ranch style pref., basement, garage, 3 bedrm. min., within 20 mi. GAC, 30-35K. 581-6166 evgs.

FLIGHT INSTRUCTOR: Must be available evenings & week ends, CFIL pref. 234-6546.

FAN: Large attic fan, w/wo louvers, Len McChrie, Ext. 57-255.

MISC.: Hardtop for '67 MGM. 581-1258.

COMIC BOOKS: Old magazines for collection, also science fiction from magazines, paper-backs, hard-cov. Dupls. given to hospital. Will pick up. Steven Rosenstein Ext, 9066.

BOWLERS: Tues., mix. league, 6:40 p.m., 9/5, Woodbury Lanes, Plainview. WE 1-6099.

BOWLERS: Tues., Brown League, 6:30-9 p.m., Sept. - Apr., 4 man teams & indiv. nded. R. Hachemeister, Ext. 84523.

REFRIG.: Sma. camper type, gas oper. 732-5693.

ENG.: 305cc Honda Superhawk. PY 8-4258.

APT.: 2 bdrm., Oct. occup., 3 adults. 293-8039.

APT.: 3 rm., Nov. occup., yg. bus. couple. 433-1251.

HOUSE: Within 20 mi. Grumman, ranch pref., bsmt., gar., 3 bdrm. min., 30-35K. 581-6166, evgs.

SHOP MANUAL: '67 Ford. 588-8058.

FUEL TANK: For Mercury outbd., w/hose. 543-6119.

TRLR.: Sma. util., for open rd. MI 3-7651, after 4:30 p.m.

BOWLERS: Mix. League, nd. guys, Tues. nite, 6 p.m., Plainview. Tom McCarthy, Ext. 1606.

Lost

GOLD WATCH: Lady's, Caravelle, Plt. 3 vic. 921-0723, after 4 p.m.

For Adoption

KITTEN: Fem., 6 mo., all shots. 212 343-3945.

PUPPIES: Collie mix, 3, 6 wk. 928-2030.

GUINEA PIG: 1 adult male. 929-6732.

GERM. SHEP.: Germ. short hair pointer, fem., 1 yr., all shots, spayed, gd. w/child., nds. fenc. yd.; 2 male cats, 1 blk., 1 blk./wh., altered. 261-8653.

Ride Wanted

RIDE: Bay Shore to Plt. 1, 7 p.m. to 3:30 a.m. Frank Amereno, Ext. 3173.

RONKONKOMA: Exit 59 to Plt. 1, 6-2:30 a.m. 585-1692.

BRONX: Or Manhattan, Sheridan Ave. & 165 St. area to Plt. 24, 3:48-12:18 a.m. 515 588-9489.

PT. JEFF. STA.: Off Nesconset, to Plt. 34 complex. Bob Leonard, Ext. 3062.

Car Pool

CROSS BRONX EXPWY.: To Bethpage. 212 923-8509.

For Sale

MISC.: Var. sz. Holly plts.; oak chifferobe, Armore, 90 yr., $85; house, Massapequa, 7 rm. ranch, dbl. o'sz. gar., bsmt., den, firepl., carpet, appli., 100x100, treed, sch. dist. 23, walk to RR & stores, $39,990, prin. only. LI 1-1960.

HORSE: Reg. ½ Arabian mare, 3 yr., 15h, all equip. incl., $450. 692-7790.

FAN: 20 in. G.E. port., 3-spd., thermostat & elec. reverse, $20; Biltrite coachette, silver gray, $20. 265-3770.

CAMERAS: Agfa Optima 1A, 35 hh, f2.8 lens, comp. auto., exp. meter, flash gun, case, $30; Kodak Instamatic mod. 315, $15. 728-0994.

HOUSE: Bellmore, 4 bdrm. split, 1½ bath, din. rm., carpet, air cond., o'sz. plot, walk to RR, $39,900. SU 1-4327.

HOUSE: E. Northport, 4 bdrm., 2 bath, eat-in-kit., sun porch, din. rm., lrg. playrm., 2 car gar., over ½ acre, w-w, s-s, xtras, $40,000. 368-2982.

HOUSE: Huntington, 3 bdrm. ranch, gar., patio, pool, 3 appli., s-s, w-w, lndscpd., $24,000. HA 7-8019.

at your SERVICE

This is a free service to Grumman personnel for non-commercial advertisements, accepted on a first-come, first-served basis. Classified advertisements are carried in PLANE NEWS only on the basis that everyone replying to such advertising will receive fair and equal consideration regardless of their race, creed, color, or national origin.
Type or print ad on form available at Employees Service and Engineering counters, and send via interplant mail to PLANE NEWS, Plant 5, Bethpage. List home phone (with area code if outside Nassau or Suffolk). Limit: one ad per person per issue. No item under $10, no firearms or ammunition.

BOAT: 22 ft. Zobel, hdtp. skiff, 125 hp f.w.c., S/S, depth find., 50 gal. Monel tank, 2 batt., 2 anchors, 1 season pvt. dock., Bay Shore, xtras, $2,300. MO 6-8145, after 6 p.m.

BOAT: 20 ft. Thompson, cab., 75 hp Johnson, $1,750. LT 9-1023.

SAILBOAT: '28 classic, blt. in Germany, 32 ft., keel, teak deck, cab., slps. 2, fully equip., $2,900. 433-6497.

BOAT: 28 ft. Ivichsen sportsfisherman, flybridge, 210 Chrysler marine, S/S, xtras, in water. MO 5-6033.

BOAT: 17 ft. Mitchel, all fbgl., 40 hp Evinrude, $550; comp. rock space, Seaford, $75/per season. IV 3-9369.

BOAT: 21 ft. rugged util., dbl. plank, 100 hp inbd., 50 gal. stain. steel fuel tank, seats 8, hd., seat cush., xtras, rdy. for water, $1,100. 421-5589.

BOAT: 18 ft. plywood w/fbgl., nds. seat cush., 100 hp, '64 Mercury outbd., 4-whl. '66 Holsclaw trlr., $600 or will trade for equal value. pick up truck. 265-4319.

BOAT: 18 ft. Anglomatis, '69 Evinrude 40 hp, new pwr. hd. to prop., $550. 883-2560.

BOAT: '54, 35 ft. Sportsfisherman, 275 hp Crusader f.w.c., slps. 4, fully equip., $5,000. 666-5674.

SPORTSFISHERMAN: '59 Ulrichsen, 27 ft., flybridge, '71 Chrysler 225 hp, f.w.c., outrig., fgt. chr., fishwell, radio S/S, depth find., dinette, 80 gal. fuel tank, slps. 4, xtras, $4,200. 587-3877.

STARTER: 12 v for Chris Craft mod. K eng., 95 hp, left hand rotation, opp. of std. rot., $25. 541-2835.

BOAT: '66 MFG fbgl., 14 ft. skiff, 33 hp Twin-ski Everude elec. start., 2- 6 gal. tanks, lounge seats, compass, Navy tp., full vinyl wint. cov., '69 Holsclaw tilt trlr., Bulldog jack, lrg. 12 in. whls. 567-0323.

ROW BOAT: Cust., honeycomb seats, $75. 671-0517.

BOAT: 10 ft. fbgl. sailboat, 60 sq. ft. dacron sail, 4 sailor cap., trlr., $300. 751-5335.

STARCRAFT: '70 Starmaster camper, stove, icebox, bks., slps. 6, best offer o'$1,100. 543-9587.

SPARE WHL.: For boat trlr., 5.00/5.70, 8 tire, hvy. dty. hitch. 265-0479.

WATER SKIS: Caprice, west. wood. mfg. co., lapstrake btm., never used, $40. 261-0512, after 6 p.m.

EQUIP.: Ham code Vibroplex orig. semi auto. keg, 1 yr., $21.50. HA 3-3003.

DRUMS: Comp. set of prof., $175. 671-0517.

HOUSE: N. Massapequa, 3 bdrm. ranch, eat-in-kit., liv. rm., fin. bsmt., all GE appli., 63x95, fenc. yd., gar., $36,000. PE 5-0176, after 5 p.m.

HOUSE: Westbury Hills, 3 bdrm. brick split, 2½ bath, 2 car gar., semi fin. bsmt., ¼ acre, lrg. liv. rm., din. rm., fam. rm., patio w/slid. drs., 3 air cond., ohw, $23,300 take o'mtge. @ 6%, $39,900. 333-5223.

HOUSE: Greenlawn, 8 rm., 2 bath, 2 car gar., ½ acre, $40,000. 271-9164.

HOUSE: Pt. Charlotte, Fla., 2 lrg. bdrm. ranch, lrg. div. & din. rm., lndry & store rm., gar., low tax. 864-3140.

HOUSE: S. Huntington, 5 bdrm. col., 10 rm., 1 yr., firepl., bsmt., brick & alum sid., s-s, 5 appli., 1,000 sq. ft. patio, maint. free, $47,500. 549-5332.

HOUSE: 4 bdrm. col., 2½ bath, 3 yr., panel fam. rm. w/firepl., appli., 2 car gar., bsmt., $47,900. 367-4224.

HOUSE: Nassau Shores, Massapequa, 4 bdrm. cape, 2 bath, fin. bsmt., firepl., all appli., $40,000. 798-6444, after 6 p.m.

BUNGALOW: Ferndale bet. Swan Lake & Grossinger's, 2 bdrm., bath, scrn. porch, furn., gas hot water, town water/sewer, 110/220v, 40x100, pvt. lake. PY 6-3887.

HOUSE: E. Norwich, 3 bdrm. ranch, firepl., din. rm., panel. Fla. rm., low tax, nr. sch., shops, bchs, $39,000. WA 2-4681, after 5 p.m.

HOUSE: Stonybrook Shores, 1½ acre, 2,500 ft. cust. ranch, 3 bdrm., 3 bath, eat-in-kit., fam. rm., din. rm., 2 firepl., pvt. bch. rgts., ask. hi 60s. 751-4086.

BOAT: 12 ft. fbgl. Gamefisher, swivel seat, $80. LT 9-1261.

SAILBOAT: Olympic Finn, U.S. 549, wh., 2 sails, 1 North, mast, boom. 421-4053.

SAILBOAT: '63 Pierson Electra, $3,200. AN 1-8369.

BOAT: 18 ft. Lugar cab. cruiser, '65, 60 hp Johnson outbd., elec., 2 bunks, sink, hd., stove, fully equip., in water, $875. BA 3-7874, evgs.

BOAT: 15 ft. Thompson, 18 hp Evinrude, new wrap-around windshld., ctrls., xtras, in water, $275. TU 8-5177, after 4:30 p.m.

ROWBOAT: 14 ft. mahog., new paint, $50. 546-1979, after 5 p.m.

MOTOR: 75 hp Evinrude, rebit. '65, new plugs, alt., bat., elec. start. & shift, $500. MO 1-4052.

OUTBD. HULL: 16 ft. fbgl., twin 40 hp Johnson outbds., windshld., canv. tp., teleflex steer., cush., anchor, etc., $595. LT 9-6588.

REFRIG.: 6 cu. ft., avocado, 1 yr., $65. 293-0534.

CRUISER: Net 5 tons, cust. '31, Lathrop eng., low hrs., hyd ctrls., f.w.c., legal hd., short wave radio, elec. refrig., gas stove, 2 bunks, press. water, must sell. Sportman, boat yd., TU 8-5885.

For Sale

BOAT: 16 ft. Glasspar fbgl., 40 hp Johnsnn elec. start, Holsclaw trlr., all equip., $1,095. 585-0005.

MANUAL: Marine compre. eng. shop, Evinrude eng. from '56-'62, $10. IV 6-6218.

SAILBOAT: Sloop, 22 sq. meter, 32 ft. LOA, 5½ ft. beam, teak deck, outbd., hd., cuddy cab., fully equip., $2,500 or best offer. 433-6497.

BOAT: 17 ft. Thompson, 50 hp Evinrude, $350. 893-2071.

HOUSE: Wantagh, '51 Levitt 3 bdrm. ranch, 2 bath, ext. liv. rm., w-w, gar./workshop, xtras, ask. $34,900. PE 5-1250, evgs.

HOUSE: Eaton's Neck waterview, 4 bdrm. hi-ranch, 3 bath, bch. & moor. rgts., new carpet. & patio, $51,500. 757-2559.

HOUSE: Bay Shore, 3 bdrm. ranch, 60x117, new heat. sys., hardwood fl., formal din. rm., eat-in-kit., panel. liv. rm., encl. patio, detach. 1½ car gar., low tax, $25,000. 589-8495.

PROPERTY: Loon Lake, Adirondacks, 4 housekeep. cottages, owners house, 4 alum. boats, nr. Gore Mt. ski ctr. 261-6413.

PROPERTY: 2, ½ acre bldg. sites in Lehigh Acres, Fla. West Coast commun., $2,500/ea.; '72 proof dollars $12; mint dollars and '72 proof sets. $7. IV 6-3713, after 6 p.m.

COUCH: 4 pc. gold sect., $95. 378-5612, after 6 p.m.

DIN. RM. SET: Heywood Wakefield col. maple, hutch, tbl., 2 capt. chrs., 4 mate chrs., $600. 549-3966.

MISC.: Child's Lullaby matt., 32x60; port. sew. mach. case, for Sears Kenmore, new; trlr. hitch frame type: Remington Rand elec. razor Speedak; Dreyco volt. reg., 12v, fits '61 Chevy, new. George Devoe, Ext. 2720.

DINETTE SET: 30x40 tbl., xtra leaf, 4 cush. chrs., comp. fin. in wood grain formica honey wal., $150. 864-3878.

DINETTE SET: 5 pc. Daystrom, wh. w/gold trim, 60x35 oval tbl. w/leaf, 4 thick cush., chrs., 1 yr., $100. 549-8714.

DISHWASH.: Westinghouse conv. w/wood tp., mod. SC295L, will transport up to 20 mi., $100. IV 6-4930.

FALCON: '62, 6 cyl., bkt. seats, $100. SU 1-2202.

MUSTANG: '66, pwr. steer., 2 new tires & auto. transm., R&H, less eng., $200; 850 CFM Holley dual feed carb, used twice, $70; 4.11:1 ring & pinion zoom gears, fit '55-'64 Chevy, $40. 289-2350.

T-BIRD: '56, wh., auto., new paint, ask. $1,000. OR 1-3799, after 6 p.m.

FORD: '69 Torino GT, 428 Cobra jet, 4-spd. Hurst, bkt. seats, AM/FM stereo & 8 track tape play., 4 new tires & mags. JU 7-5137.

VW BUS: '66, new bks., tires, & batt., '70 eng., 9 pass., $1,025 or best offer. AN 5-2679.

TORINO: '71, 500, new radial tires, snows, bks., 38,000 mi., $1,800. 922-1474.

CHEVROLET: '69 Biscayne, 4-dr. sed., std., 327, vinyl int., R&H, 5 new tires, 45,000 mi., bal. of warr. avail., ask. $1,250. CH 9-2515.

MAZDA: '71, R100, Wankel coupe, 4-spd., full instru., reclin. bkts., radio, pwr. ant., radial tires, low mi., $2,300. Dave Rothschild, Ext. 1670.

CORVETTE: '64 conv., 327 CID, rec. o'haul, pwr. glide, posi, new radiator, $1,100. WE 8-8836.

MERCURY: '70 Cougar, blk. w/blk. vinyl tp., pwr. steer., radio, cons., blk./wh. int., 22,000 orig. mi., ask. $2,300. 549-8714.

FIAT: '68 Spyder conv, new disc bks. & tp., 27,000 mi., 35 mpg, $825. 775-7621.

VW: '69, AM/FM, 29,800 mi., $1,200. 543-0972.

CAMARO: '68, new 40 c.i., bks., wide ovals, clutch, paint, 3-spd. stick, 2 snows, $1,700. 423-1106.

DATSUN: '69, 600 conv., wh. w/red int., w/w, 2 tps., ask. $1,550. 694-1069.

DUNE BUGGY: Conv. tp. w/side curt., sand tires, tow bar, lg. chassis new bks., $500. 472,1706, evgs.

STORMS & SCRNS.: 12 wood full, pict. wind. incl., 2 alum. storm drs. incl. scrns. PY 6-1139.

MISC.: Alum. storm dr., wind. & scrn., 6 ft. 6 in. x 2 ft. 7 3/8 in., $15; 10 hp Johnson outbd., $50. JU 1-4814.

CHR.: Uphol., drk. grn., $10; rocker. WE 5-8570.

SOFA: & chr., ask. $100 or best offer. F. Deban, Ext. 86183.

MISC.: 20 in. Sears Kenmore elec. range, 2½ yr., $75; metal kit. cab. & s/s sink cab. $40. 796-7172.

REFRIG/FREEZER: Combo., no-frost, 15 cu. ft., 2 yr., ask. $150. 212 462-2356, after 5 p.m.

FURNITURE: Sofa bed, formica kit. tabl., 4 chrs. 293-7429 after 6 p.m.

For Sale

MERCURY: '71 Marquis, 4-dr. sed., pwr. steer. & disc bks.. air cond. w/climate ctl., $2,595. 249-1641, after 5 p.m.

CHEVROLET: '65 Impala sta. wag., air cond., pwr. steer., '66 V-8. WE 5-2662, after 5 p.m.

FORD: '65 Country Squire, 10 pass., full pwr., radio, $550. 261-5703.

PLYMOUTH: '67 Barracuda, 2-dr. hdtp., 6 cyl., auto., pwr. steer., snows, $800. 724-7947.

CADILLAC: '61. $100. JU 7-0175, evgs.

TRIUMPH: TR-3, '57, some bdy. work req., side panels, snows, many new parts, $195. WE 8-2642.

FORD: '70 Maverick, 27,000 mi., auto., R&H, plastic cov. seats, 2 mtd. snows, $1,500. 473-6443.

NOVA: '70 SS-350, Rally mag whls., new tires, bkt. seats, AM/FM, tape deck, hvy. dty. susp.. posi. rear, 4-spd. Munci sag tran., 32,000 mi., $1,975. 286-8599.

VOLVO: 140 series & 164, snows & rims, w/w, $40. 221-2618.

STA. WAG.: '65 Pontiac Bonneville, pwr. steer. & bks., xtras, $650. 735-0989.

CORVETTE: '67 conv., 327-375 hp, comp. rebit. pwr. train. AN 1-0884.

MUSTANG: '70 Mach I, pwr. steer. & bks., air cond., $2,450. 883-2560.

CHEVELLE: '71 SS454, 400 hp turbo, Cragars, elec. fuel pump, hdrs., accel. ign., race susp. w/ladders, cust. paint & int., stock parts old sep., $2,800. 888-8794.

STA. WAG.: '63 Chevy Nova, 6 cyl., new eng. asem., 18,000 mi., 2 snows, new batt. & bks., inspect., $275. 692-2738.

CAMP. TRLR.: Puma, slps. 8, dbl. dinette, sink. stove, ice box, awn., xtras, $1,200. 921-2865.

CAMP. TRLR.: '70 Apache Macea III, slps. 6, stove, sink, ice box, used 5 times, $1,150. 981-2608.

MINI BIKE: Stellar, 2½ hp, $90. PE 1-7008.

BRIDAL GOWN: Sz. 5, wh. silk organza & lace, lg. veil & cap, make offer. WE 1-1338.

TENT: 10x16 ft. Sears, carry. case & divider wall, used 2 yr., $125. Al Tyler, Ext. 84884.

GOLF CLUBS: Full set, bag & hd. cov., 2-9 irons, 1, 3, 4 woods, Ram, $80. SH 4-9057.

TAPE RECORD: Webcor, cassette, batt. pwrd., $20. 261-1509.

MISC.: Lennox china, pine cone patt., 12 pc. set., 8 soup bowls & desert dishes, $375; Ital. prov. bdrm. set. twins, spg., foam matt., chest dwrs., dbl. dress. w/mirror, ngt. std., plate gl. tps., $300. French prov. sofa, $75. 757-2141.

STEREO: Port. Motorola, sep. bass & treble ctrl., spkr., select. ctrl., 2 detach, spkrs., $50. 212 767-0792.

MISC.: 9 ft. 4 in. surfbd., $25; Johnson's wax elec. fl. polish. & scrubber, $20. PI 1-6032, after 5 p.m.

VEND. RTE.: Pt. time candy, cookie, 10 mach. 681-9588, after 5 p.m.

CAMERA: 8 mm, proj. & equip., Cine Kodak mod. 60, Fl.9, case & filt., metal case & xtra bulb, Fed. enlarger mod. 250, Argus Jig-a-matic, new, print & dry. & print. box, 2, 35mm daylgt. develop. tanks, asst. trays, solutions, clips, etc. 212 RE 9-6061 after 6 p.m.

SPIN. REEL: Daiwa mod. 7700, surf cast, reel, 3:1 retriever ratio, 300 yd. cap., 20 lb. test line, ask. $10. B. Movsesian, Ext. 1031.

ACCORDION: Ital., 120 bass, blk., 7 stops, case, $150. 798-5619.

HOT DOG CART: Scooter, stain, steel, 5 compart., reason. 822-5525, after 5 p.m.

BABY FURN.: Lullaby wh. prov., canopy crib & match. dbl. dress., $125/both; Bilt-rite Pk. Ave. navy blue coach, $100. 669-9022.

AQUARIUM: 15 gal. tank, lgt. cov., pump, heat., filt., rocks, plts., etc., $15. 732-1458.

GUPPIES: Fancy, red delta tails, home bred. 665-0875.

DACHSHUND: MINI, AKC reg., short hair, 8 wk., paper train., shots, $100. 234-0734.

PUPPIES: Siberian huskies, AKC, champ sired, blk. & wh., male & fem. 731-7046.

FORD: '66 Galaxie 500, V-8, 4-bbl., 2-dr., vinyl tp., auto., pwr. steer., 5 Sears steel belt. radial tires, 52,000 mi., $625. 289-0175.

VW: '61 w/rebit. '64 eng., new bks., clutch., heat. boxes., gen., volt. reg., nds. 1st gear. $125. 585-5426.

MOTORCYCLE: '71 Honda SL350 K1, $700; 7 in. Corvette rims, $20; Pa. hand grasscutter, unmotor. type, used 1 season, $25. 589-2470.

ENG.: '63 VW, 40 hp, comp. from muff. to clutch, rebit. & install., $165. 273-6239.

For Sale

MISC.: Cliffnrd manifold & Holley 4-bbl. carb., for 199/232 CID Amer. motors 6 cyl. eng., $75: 18 in. self prop. reel mower, Craftsman. $40; Sunbeam twin elec. mower, xtra blades, $25. 724-8821.

HONDA: SL-100 motocycle, '71, less than 1,000 mi., $380; carry. racks. avail. 724-0234, after 6 p.m.

SNOW TIRES: 2 ea/695x14, $10/ea.; 2 ea. 735x14, $17.50/ea., all mtd. on whls. WE 5-1845.

TAPE DECK: Stereo 8 track, car, $25. 799-0142.

CHRISCRAFT: '58, 26 ft. Sportsfisherman, twin 105 hp, Blocks, xtras, in water, $3,000; 4-whl. trlr., $120. William Bourguignon, Ext. 57-231.

SAILBOARD: 11 ft. fbgl., comp., $65. 587-8479.

STEREO PLAY.: 8 track w/FM radio, $35. Dick Traube, Ext. 84977.

HAIR DRY.: Presto Mist, xtra. lrg. hd., remote ctrl. w/4 set., travel case, new, $24. 781-8653.

GERM. SHEP.: Ped., male, 8 mo., housebkn., all shots, friend. & gd. natured, $10. 549-8084.

RADIO/TELE.: Ship to shore, Ray Jefferson mod. 725, new, VHF-FM. HA 7-3649, after 5 p.m.

WASHER: Apt. sz. Hoover, spin dry., $75. 691-3452.

DODGE: '70 Dart, grn., 4-dr., 6 cyl., air, pwr. steer., auto., (radio, 40,000 mi., $1,700. 751-5521

FIAT: '70, 850 sport conv., new tires & top., ask. $1,000. 598-2506, after 4:30 p.m.

COMET: '65, 6 cyl., std., $195. LT 9-2701, after 5 p.m.

MGB: '68 red conv., 6 ply radial tires, wire whls., Tonneau tp., $1,195. 935-0678, after 6.

BUICK: '66 Special, 6 cyl., AM/FM, 4-dr., $520. 475-2447.

DODGE: '71 Dart, 4,000 mi., air cond., pwr. steer. & bks., grn. 4-dr., 6 cyl., snows w/whls., $2,500. SU 1-9621.

STA. WAG.: '71 Chevy Vega, std., belt. tires, snows, 17,00 mi., $1,800. 212 631-4331.

FORD: '63 Falcon, 4-dr., blue int., 6 cyl., new parts, snows & whls., $25. PE 5-6636.

SUPER VAN: '66, Ford, auto., insul. & panel., new carb, bks., & shocks, cust. front & rear guards, twin spares. CH 9-0312.

MOTORCYCLE: '72 Honda CB, 350cc, 3,500 mi., orig. owner, helmet, xtras. 757-7542.

CAMPER: '71 VW, pop-up tp., 22,000 mi., xtras, $3,200. 283-5724.

WHLS.: & tires for trlr., 3, 8 in., 1 never on rd., $10. WE 1-1330.

CAMPER: '70 Starmaster 6, Starcraft, stove, sink, icebox, spare tire, slps. 6, & xtras best offer o'$1,100. 543-9587.

DIN. RM. SET: Drk. wood, gl. front china cab., 6 chrs., buffet, tbl. w/2 leaves, opens to seat 12, tbl. pads, hvy. prot. gl. tp. for buffet & din. tbl., make offer. 799-6941, after 5:30 p.m.

ORGAN: '71 Farfisa spinette, wal., xtras, $450. IV 1-3405.

POOL: 40x54 in. dia., ladder, Lomart filt., vinyl liner, 7 yr., $100. 724-7923.

MISC.: Horse, 3 yr. mare, ½ Arabian, 15 h, chestnut, spirit., $400; lady's rid. boots, jacket, hunt cap, lrg. pony harness, blanket. 692-7790.

ACCORDION: Cantarini, 120 bass, blk., med. sz., $100. 588-1778.

SECY. BREAKFRONT: 6½ ft. x 5, drk. wal., ask. $100. 541-7789.

AIR COND.: 1 - 6,000 BTU, $130; 1 - 5,000 BTU, $85; 10,000 BTU; 2 in. fan, $20; cooler, $10. OV 1-8695.

STORMS & SCRNS: 2 wh. alum., dbl. hung, 36 x 50, never used, $25/both. HR 3-5951.

REFRIG.: 15 cu. ft. Westinghouse, $70. 666-4524.

FENCE: 175 ft. cyc., posts & brackets, 42 in. hi., $125. FR 8-6849.

CURVED BAR: Blk. formica tp., $50. AR 1-1149.

BIKES: 2 Schwinns, 10-spd., men's Varsity Sport., wh., $65; blue 3-spd., lady's, $35. instr. bk. 868-4474.

GONSET COMM IV: 2 meters, match. VFO for 6M, 2M, 1¼M, D-104 mike, manuals, xtras, $225. 931-5748, bet. 12-3 p.m.

MISC.: Tbl. saw, 12 in.; zoom movie camera, tripod & proj.; typewriter w/tbl.; heat slicer; elec. mix. w/bowls; cons. sew. mach. w/attach.; fl. polisher; lady's bowl. ball w/bag; sz. 7 lady's ice skates; paint sprayer; punch bowl set; outdr. grill w/rotiss.; others, reason. 751-3814.

POOL FILT.: & ¼ hp pump, 50 lb. bag of charcoal filt. element, new, $40. 732-1390.

OLDSMOBILE: '66 Starfire, 79,000 mi., maroon, air cond., $400. WE 5-8250.

FORD: '64 Fairlane, $300. IV 1-7151.

For Sale

T-BIRD: '56, wh., auto., new paint, ask. $1,300. OR 1-3799.

RAMBLER: '60, 4-dr., R&H, snows, ask. $150. 486-1458.

VW: '69 Squareback, AM/FM, Michelin tires, elec. rear defrost., mtd. stud snows, port. roof rack, ask. $1,900. 486-1458.

CORVETTE: '64, 327-375 hp, fact. fuel inject., conv., 2 tps., mags, 4-spd., AM/FM. 261-5128, after 4 p.m.

FORD: '68 LTD, 2-dr. hdtp., aqua, vinyl tp., auto., $995. 751-1624.

VW: '65, 1500cc, screamer kit, hvy. dty. clutch & gen., new bks., oil press. & temp. gages, $700. JU 1-3125.

STA. WAG.: '67 Datsun, stick shift, w/w, recent. eng. o'haul., new bks., 39,000 mi., 24 mpg, ask. $695. 889-6038.

MISC.: '69 Cadillac, 2-dr. coupe, full pwr., $3,200; draft. tbl., blt. in lite, comp. adj., $50. PY 8-0464.

VW: '65, recent. rebit. motor, new tires, bks., & batt., AM/FM, $500. PE 5-4386.

VW: '70, red, auto., snows, low mi., orig. owner. 735-1861.

FORD: '48 sed., all orig., 58,000 mi., antique in '73, $995. 628-1156, after 5 p.m.

FORD: '64 Falcon, 6 cyl., conv., $200. PR 5-7621.

CADILLAC: '66 conv., all pwr. options, FM, tilt whl., $1,200. 796-9046.

BUICK: '70 Skylark, V-8, pwr. steer. & bks., vinyl tp., 4 new tires, $1,750. 585-7637, after 6 p.m.

CHEVROLET: '65 SS, 327, pwr. steer. & bks., auto. 273-2802, after 5 p.m.

MG: '68 Midget conv., wire whls., new batt., clutch, & throw out bear., Tonneau cov., nds. tp. & minor work, $700. 265-1681.

DINETTE SET: Tbl., 6 chrs., copper legs & wal. formica tp., new, $60. HR 3-4732.

DINETTE SET: Tubular steel frame & formica tp. tbl., xtra leaf. 4 contour. Naugahyde chrs., ask. $50. 751-0279.

MISC.: Child's Lullaby matt., 32x60; port. case for Sears Kenmore sew. mach., new; new trlr. hitch frame type; Remington Rand elec. razor Speedak; Dreyco volt. reg., 12v for '61 Chevy. G. Devoe, Ext. 3131.

BABY FURN.: Lullaby wh. prov. canopy crib & match. dbl. dress., $125/both; Bilt-rite Pk. Ave. navy blue coach carr., $100. 669-9022.

FURN.: Couch, cocktail tbl., 2 chrs., 2 lamp tbls., $300; upright piano, $150. MO 6-8665.

DINETTE SET: Mod., blk. & yel., all formica, tbl., chrs., 2 pc. china closet, $75. MO 9-1882.

AIR COND.: Window unit, 4,000 BTU, $60. MA 3-4046.

GAR. DR.: 8x7 ft., 4 panel o'hd., all hardware, $25. JU 7-5138.

STEREO EQUIP.: Heathkit mod. AR 29, rec'vr. & wal. cab., new wired, $240; Heathkit mod. AJ 15 FM stereo tunre, new, wired, $170; Dynakit FM tuner, usedd, $35. 543-9463.

TURNTBL.: Garrard, Mod. RC88, w/mag cart dia. stylus, lvl. & base, $10. LI 1-8590.

TAPERECORDER: Sony 70 watt, mod. TC-200, reel to reel, 2 mikes, 2 channels, nds. sma. repair, $40. 587-0330.

POKER TBL.: Knotty pine, formica tp., 3 match. chrs., $90. 751-1028, after 6 p.m.

CAMERA: Kodak Retina IIIs, 35mm, F2.8, blt-in meter, Mecablitz flash, $100 or best offer. 543-5283.

SLIDE PROJ.: B&H slide cube mod 977Q, new, $85; Kodak Carousel mod. 650, lea. case, xtra lamp, 16 trays, $70. 489-1836.

SLIDE PROJ.: Kodak Calvalcade, man. or auto. timed adv., remote ctl., hi & low lgt. intensity incl. 40 trays. 757-0580.

DRUMS: Ludwig classic, 4 pc. set, hi-hat & ride/crash Avedis Zildjian, throne incl., 742-0011.

DRUMS: Kent 8 pc. set, throne, 22 in bass, snare, tom tom, fl. tom tom, hi-hat, ride & sizzler cym., fl. std. AN 5-8360, evgs.

LENS: 150mm f2.8, 6x7 SMC Takumar for Pentax 6x7, new, $205. 212 923-8509.

MISC.: Minolta hi-matic 7S, 35mm camera w/F1.8 lens, elec. eye, auto., semi-auto. & manual oper., case, flash unit, filt., xtra lens, sun shade, $90; 2 Panaonic spkr. sys., 8 & 3 in. in ea. encl., $35. 289-1661.

MOVIE PROJ.: 8mm Argus 500 AZ, zoom lens, auto. load, $25; movie camera, 8mm roll, Dejur, 3 lens turret, auto. exp., $25; G.E. exp. meter, $10; all for $45. 893-0765.

For Sale

SEW. MACH.: Straight stitch w/mahog. cab., $15. 751-1256.

MISC.: 30 ft. ½ link gal. chain & pick-up buoy, $20; 5 cork steam ship type life jkts., new, $10: 120 ft. 1x6 cedar 12S & 14S. new, $10. 599-4033.

BOAT: '48, 40 ft. Matthews, twin 300 Chryslers, 50 hrs., flybridge, dual ctrls., S/S, dept. rec., gen., 2 200-gal. Monel gas tanks, press. sys., deck house, w/conv. couch, 2 staterm., 2 hd., shower, btl. gas, galley, @ Ruthrigs shipyd., Lindenhurst, $7,800. TU 4-1189.

GONSET COMM IV: 2 meters, match. VFO for 6M, 2M, 1¼M, D-104 mike, w/manuals, xtras, $225. 931-5748, bet. 12-3 p.m.

ROTOTILLER: 20 in. Howard Gem comm., 1 cyl., 9 hp, $650. GE 3-6684, after 4 p.m.

TRUMPET: W/case, $55. 265-7738.

ACCORDION: Scandalli, Ital., 120 bass, 5 switch w/case, $75. JU 6-8248.

TAPE RECORD.: Sony, new, 3-spd., reel to reel, mike & access., $55. JU 6-8248.

WIND. FAN: Robbins & Meyer, 2-spd., rev., for wind. 33 to 39 in. 235-9894.

BUNGALOW: Ferndale bet. Swan Lake & Grossingers, 2 bdrm., full bath, scrn. porch, furn., gas hot water, town water/sewer, 110-220v, 40-100, pvt. lake. PY 6-3887, after 5:30 p.m.

HOUSE: Huntington Sta., 3 bdrm. col., 1½ bath, 2½ car gar. w/independ. heat., $35,000. AR 1-1273.

HOUSE: Commack, 4 bdrm., eat-in-kit., din. rm., fam. rm., all appli., 2 car gar., w-w, patio, sun deck, side walks, treed, grand piano incl., hi 30s. 864-7635.

HOUSE: Islip cape, 4 bdrm., 75x100, o.h.w., storms & scrns., full bsmt., att. gar., 2 tile bath, dinette, all appli., low tax., blinds, $30,000. 587-9553.

HOUSE: Huntington sch. dist. 3, 3 bdrm. split, new. remod. kit., playrm., bar, Indscpd., under $40,000. 427-9790.

HOUSE: Islip Vill., 3 bdrm. ranch, treed ½ acre, Bayberry Pt., S. of Montauk Hwy., appli., mod. kit., lrg. liv. rm., din. area, den w/firepl., lrg. playrm., pan., cath. ceil., deck, 2 full bath, Indscpd., $45,000. 581-0333.

HOUSE: Westbury, 2 bdrm. cape, full bsmt., att. gar., 2 air cond., Indscpd., exp. attic, 3 appli., $33,000. ED 4-0205.

HOUSE: Ctrl. Islip, 3 bdrm. ranch, panel. liv. rm., mod. kit., din. rm., full bsmt., gar., alum sid., 1/3 acre, fenc., walk. stores & RR, $25,900. 234-4725.

HOUSE: Plainview, Wash. Ave. vic., 3 bdrm. poss. 4 hill tp. ranch, ctr. hall, slate fl. entry, 2 bath. liv. rm. w/firepl., din. rm., lrg. eat-in-kit., mud/lndry. rm., den, 2½ car gar., patio, all new kit., carpet., ¼ acre, xtras, ask. $55,000. 692-2738.

PROPERTY: Southold, N.Y., 100x150, clear, on Goose Neck Bay, water/bch. rgts., $7,800. HA 3-1771.

PROPERTY: Woodland parcel, So. Vt., Londonberry area, cross country skiing, hik. trails to lake, nr. Bromley, Stratton, Magic Mts., reason. 421-2088.

BOAT: 14 ft. fbgl., windshld., steer. & motor ctrls., trlr., no motor, $250. 221-3089, after 5 p.m.

BOAT: 14 ft. Starcraft, alum., 18 hp Evinrude, Tee-Nee tilt trlr., all '72 under warr., $800. 589-3389.

BOAT: 17 ft. Sportcraft, fbgl., '68, 40 hp Johnson, '67 Shipmate trlr., xtras, $1,150. MO 1-4318.

plane GRUMMAN news

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Navy teams, east and west, complete second phase of Tomcat trials

(Photos by Warren Rohde and Dick Sander)

In a time-slot of only five weeks, two NPEs (Navy Preliminary Evaluations) have been performed successfully — NPE-IIA at Calverton and NPE-IIB at Point Mugu, Calif. In both cases, two Tomcats were involved.

During the NPEs, the four Tomcats, in total, logged in 178.2 flight hours in some 75 flights. And there were several "firsts" to command attention.

- Both Tomcats in the NPE at Mugu —No. 5, and No. 9 (which is bailed to Hughes)—flew for eight hours in one day.
- The Navy, using No. 9, fired Phoenix missiles successfully at live targets
- No. 2 successfully fired the 61-M gun at all critical combinations of attitude and speed in flights at Calverton
- Through the Mach 2 flight envelope, modified TF-30 engines flew stall-free

NATC flight team

Cdr. Frank Schluntz of the Naval Air Test Center at Patuxent River, Md., headed the NPE-IIB test flight team of 15 members. Rear Adm. L. A. "Swoose" Snead, F-14 Program manager, and Capt. Ken Melin of NATC, president of BIS (Board of Inspection and Survey), were on hand, as was a Grumman team headed by Tom Brancati, base manager for the west coast facility. Brancati commented that "The understanding of the system displayed by the NPE team was most outstanding and proved once again the professionalism and expertise of Navy personnel."

As fine as the NPEs evidently were, Vice President Mike Pelehach, the man in charge of the Tomcat program, had his sights trained toward the future:

"No. 16 has flown, and No. 21 arrived from Calverton August 16. Tomcat 18 is to be delivered to Miramar on October 1 for full Navy use. Then there'll be NPEs at Calverton and at Point Mugu in November. Things are moving along at a good pace. . . . "

'Well Done'

A mark of how good the pace (and the aircraft) were came from Capt. Clyde Tuomela, deputy Program manager for F-14 Test and Evaluation, NATC, who remarked that "It is rare when anyone in the testing community passes out a 'well done' on good performance." And he followed up by saying, "All personnel who have worked for the successful completion of F-14 'NPE-II Bravo' should take pride in a job smartly executed."